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CONTRIBUTION TO THE PATHOLOGY AND CLINICAL DIAGNOSIS OF STATUS LYMPHATICUS.*

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Status lymphaticus, as Paltauf has defined it, consists, anatomically, of persistence or hyperplasia of the thymus gland, hyperplasia of the tonsillar ring, lymphatic elements of the spleen, lymph-nodes, lymphatic follicles of the digestive tract, and lymphoid marrow of the long bones. It is frequently, though not always, combined with hypoplasia of the arterial system and genital organs. The most significant fact in connection with this diathesis is a disposition to sudden death from comparatively trivial causes.

Since publishing a former article on status lymphaticus, the writer has made a further study of cases from the Bellevue Hospital Pathological Department, through the courtesy of the director, Dr. Charles Norris. Among approximately 1600 autopsies, there were forty-four cases of status lymphaticus. In addition, one case from the Manhattan Eye, Ear and Throat Hospital and one case observed at the Post-Graduate Hospital are included, making a total of forty-six.

The diseases with which status lymphaticus is associated are shown by the following table, which gives the anatomical diagnosis of the cause of death:

Epidemic cerebro-spinal meningitis, 15 cases; acute general military tuberculosis, 1 case; tubercular meningitis, 1 case; papillomata

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of larynx,—suffocation from accidental removal of tracheotomy tube, 1 case; intra-cranial tumors, 3 cases; general burns of head and body, 1 case; acute gastric ulcer, 1 case; akromegaly, 1 case; typhoid fever, 1 case; suppurative pleurisy, 1 case; acute infectious endocarditis, 1 case; acute hydrocephalus internus, 1 case; acute suppurative otitis media, 1 case; glanders, 1 case; caisson disease, 5 cases; tetanus, 1 case; septicemia, 1 case; acute articular rheumatism, 1 case; pyemia, 1 case; arsenical poisoning, 1 case; lobar pneumonia, 1 case; acute sinusitis (of accessory nasal cavities), 1 case; broncho-pneumonia, 1 case; exophthalmic goiter, 1 case; no discoverable cause of death other than status lymphaticus, 2 cases; total, 46 cases.

One of the last-mentioned cases was undoubtedly an instance of thymic asthma. Three of the subjects belong to the negro race.

There were many grades of status lymphaticus, from hyperplasia of the thymus gland alone to cases of the most pronounced type of thymic and glandular hyperplasia combined with hypoplasia of the genital organs and arterial system.

Statistics vary as to the normal weight of the thymus gland. For instance, Bovaird and Nicoll, who weighed the glands of 495 children under the age of 5 years, found that the average weight of the thymus during the first two years is about six grams. They believe that the gland diminishes in size after the end of the second year. John Howland considers any gland weighing over ten grams to be pathological. According to Hammar, the thymus gland in the new-born child weighs thirteen grams. He finds that its maximum weight is reached between the eleventh and fifteen years (puberty), after which it gradually diminishes in size. The high figures obtained by Hammar are attributed to the fact that the thymus undergoes rapid involution in both acute and chronic diseases. This observation has been substantiated experimentally by chronic underfeeding of dogs, which also produces a rapid diminution in the size of the thymus (Johnson).

The gross features of status lymphaticus have already been mentioned. The microscopic changes of the lesions occurring in the thymus, lymph glands, spleen, etc., have been described by Ewing, Paltauf, and Ohlmacher as simple hyperplasias. Ewing has observed hyperplasia of the lymphoid marrow of the long bones and has noted a diminution of the amount of the hemoglobin in the blood, as well as a lymphocytosis of seventy-six per cent in one case.

In the thymus, Blumer observed a general hyperplasia of the lymphoid elements, occasionally associated with endothelial proliferation. In the lymph-nodes, splenic follicles, tonsils, and lymphatic elements of the intestinal tract he found a general hyperplasia with a proliferation of the cells in the germinal centers, accompanied by slight degenerative changes in the proliferated cells.

Kyrle found marked parenchymatous destruction of the testicles, epididymis, and prostate in three cases of status lymphaticus; while Hermann found abnormally large ovaries, caused by an increase in the connective tissue, especially in the cortex. In consequence of these changes, the ovarian follicles often fail to rupture and cystic degeneration of the ovaries occurs, resulting in retarded menstruation or total absence of menstruation. Neusser states that Bartel has reported a case of status lymphaticus complicated by the occurrence of two extra-uterine pregnancies, while he himself observed a left-sided tubal pregnancy where autopsy demonstrated a patent foramen ovale, fetal lobulation of the kidneys, and typical status lymphaticus.

Shiota, working in Prof. Weichselbaum's Institute, reports that in appendicitis he frequently found distinct signs of the lymphatic diathesis. He also noted in status lymphaticus a marked tendency to the formation of fecal concretions, and frequently a highly developed lymphatic apparatus in the appendix.

Neusser calls attention to an interesting observation of Bartel, who found in the early days of life a hyperplastic growth of the lymphatic tissue in the body. On the other hand, during and after puberty he observed atrophy of the parenchyma of the lymph-nodes with the connective tissue framework markedly increased in amount. Thus, Bartel distinguishes two stages, a hypertrophic (hyperplastic) and an atrophic. He believes that the developing lesion in the stroma of the lymphatic organs runs parallel with the anomalies of development in other organs, such as hypoplasia of the arterial system and genitals, syringo-myelia, glioma, and fetal lobulation of the lungs and kidneys. Bartel holds that the status lymphaticus of Paltauf is merely one manifestation of a more or less common hypoplastic constitution, which may be termed "*status hypoplasticus*." At present, it is impossible to say whether Bartel's status hypoplasticus develops from Paltauf's status lymphaticus as the individual grows older, or whether both forms are merely part of one system which is developed from a common embryonal impulse.

The first of the following five cases,—hitherto unpublished,—is taken from Dr. Chappell's service at the Manhattan Eye, Ear and

Throat Hospital; the others are from Dr. Norris' Bellevue Hospital records:

Case 1. Mary P., 2 years old; first seen in Dr. Chappell's clinic, February, 1910. The child, an orphan, was brought to the hospital suffering from dyspnea and loss of voice. The dyspnea was marked and was of the inspiratory type. The duration of the illness had not been ascertained by the State Charities' agent in charge of the case. A tentative diagnosis of papillomata of the larynx was made. Although I was unable to obtain any evidence of enlargement of the thymus by physical examination, I sent the child to a well-known X-ray specialist. He reported that the plate showed no signs of a large thymus.

A few days later, the child was anesthetized with chloroform, and the diagnosis of papilloma of the larynx was confirmed by direct inspection with a Jackson speculum. During the narcosis, the breathing became more and more obstructed—due to the growth in the larynx—and a tracheotomy was performed.

Following this operation, the child carried the tracheotomy tube continuously during her stay in the hospital. In the course of the next year and a half she was anesthetized four times for the purpose of eradicating the papillomatous mass in the larynx. The members of the house-staff and I noticed that the child seemed to bear chloroform anesthesia badly, the respiration being chiefly affected, becoming shallow and irregular. During the last two narcoses it was necessary to discontinue chloroform and administer ether.

In June, 1911, while the night nurse was temporarily absent from the child's room, the tracheotomy tube was accidentally dislodged and the patient suffocated.

Autopsy report: (Dr. L. W. Strong). Body of female child, about $3\frac{1}{4}$ years old, well-nourished and strong. Considerable subcutaneous fat. Tracheotomy wound below the thyroid 1.5 cm. long. Veins of neck distended with dark, fluid blood. On opening the thorax, the thymus presents in the mediastinum, forming two large lobes, covering the entire pericardium and extending upward to the clavicle. Weight, forty grams. On section, the center contains considerable purulent fluid. Lungs: Pleura smooth; no fluid in cavities. The lungs, on section, ooze dark, fluid blood, mixed with small amount of air. The bronchi are filled with bloody froth. No consolidation. Lymph-nodes not remarkable. Heart: Pericardium, valves, and muscles normal. Lymphoid tissue at base of tongue increased in amount.

On opening trachea from behind, a papillomatous mass present arising from the front of the cricoid cartilage, (1.5 cm. long & 1 cm. diameter; 5 cm. broad). Head not opened. Abdomen: Peritoneum smooth; no fluid. The mesenteric lymph-nodes are numerous and enlarged from 1 to 1.5 cm. in diameter. Liver: Normal. Spleen: Dark red on section; pulp increased; follicles appear as distinct grayish-red nodules. Kidneys: Dark red; otherwise normal. Adrenals: Normal. Small intestine: Mucosa pale, everywhere covered with patches of lymphoid tissue from 1 to 3 mm. in diameter. Peyer's patches pale, very distinct, and numerous.

Diagnosis: Papilloma of larynx; acute venous hyperemia of all the internal organs; status lymphaticus.

Microscopic report by Dr. Jonathan Wright: "Thymus gland shows little or no change in its minute structure, unless possibly it has relatively a larger amount of lymphoid cells as compared with the other normal constituents of the organ. Lungs: Many of the pulmonary alveoli are full of recently effused fibrin and lymph. Liver: There are no noteworthy changes in the minute structure. Peyer's patches: The epithelium of the papilla is swollen and granular. The lymphoid layer is thick, but nodes are indistinguishable, and the germinal centers are difficult to find."

Case 2. Wm. F., 10 years old. Was admitted in semi-comatose condition, an incomplete history being obtained by the ambulance surgeon, who stated that the patient was well until the day of admission, when he awoke in convulsions. He complained of severe headache and vomited. Died during the same evening.

Autopsy: Well-nourished boy; plump arms and legs; no hair on pubes; thymus enlarged, weighing 36 grams; aorta contracted; Peyer's patches and solitary follicles hyperplastic.

Anatomical diagnosis: Status lymphaticus; pharyngitis, acute; sphenoiditis, acute; ethmoiditis, acute. Remarks: No evidence of meningitis on gross or microscopic examination.

Case 3. F. M., male, aged 21. Acutely ill thirty days.

Anatomical diagnosis: Chronic cardiac valvular disease; acute infectious endocarditis; acute fibrous pericarditis; status lymphaticus. The thymus is enlarged and extends down to the auriculo-ventricular junction. The aorta is small. The foramen ovale shows in its posterior portion a circular deficiency measuring about 1 cm. The pulmonary valve has four cusps. The medulla of the suprarenals is thickened and whitish. The splenic follicles are enlarged, and the solitary follicles of the intestine are hyperplastic.

Case 4. M. M., female, 17 years old. Has been acutely ill for two weeks with pulmonary tuberculosis. The individual hairs of the head are dry and brittle; the pelvic and axillary hairs are scant; the thighs are rounded and plump. Thymus weighs 21 grams and extends two-thirds of the way over the heart. The lingual tonsil is markedly hypertrophic and the lymph follicles of the spleen are enlarged. The ovaries are well developed, although the uterus is of the infantile type. Most of the glands in the abdominal and thoracic cavities show tuberculous changes and do not concern us here.

Anatomical diagnosis: Tubercular meningitis; chronic pulmonary tuberculosis with cavities; status lymphaticus, etc.

Case 5. E. McE., boy, 16 years old. Was brought into Bellevue Hospital suffering from acute enteritis. He died after an illness of two days.

Anatomical diagnosis: Acute enteritis; acute parenchymatous nephritis; status lymphaticus. The thighs are rounded; the perineum broad; pubic hair, female type; axillary hair absent. Superficial lymph-nodes palpable. Thymus weighs 30 grams and reaches to auriculo-ventricular junction. The descending aorta contains numerous small, fatty atheromatous plaques. The mesenteric, peripancreatic, and peri-gastric lymph-nodes are all enlarged.

Pathological summary: The one common feature of these cases is the enlargement of the thymus gland and the hyperplasia of the lymphatic glands.

1. Enlargement of the thymus was noted in all instances. In one case included in the series, no other evidence of status lymphaticus was present.

2. Evidences of infantilism. Twelve cases showed evidences of infantilism, such as scanty pubic or axillary hair, infantile type of uterus, under-developed ovaries, breasts, or testicles. In one male weighing 150 pounds, the penis was very small. Four of the male cases showed general rotundity of the limbs and the broad female type of the perineum. The pubic hair ran straight across the abdomen instead of upward for a short distance in the median line, as is usual in male adults.

3. Anomalies of heart and arteries. Ten cases showed anomalies of heart and arteries. There were ten instances of contracted aorta, two anomalies of pulmonary valves,—in one subject two cusps, and in the other four pulmonary cusps. There was one case of patent foramen ovale.

According to Neusser, Wiesel found that the narrowing of the aorta is combined with hypoplasia of the chromaffin system. It is thought that the heart, on account of the adrenalin deficiency and the consequent lowering of the tonicity of the vessel walls, is forced to hypertrophy or else become insufficient. For the same reason, the arteries strive to meet their increased demands by hypertrophy of the muscular and elastic fibers (Neusser).

4. Anomalies of the thyroid gland. The thyroid was enlarged in two cases. In another, the thyroid gland was nodular. Enlargement of the para-thyroids was noted once.

5. Goiter. Exophthalmic goiter was found in one case. It is very frequently associated with status lymphaticus.

6. Enlargement of the tonsillar ring was frequently noted, especially in the younger subjects.

Idiopathic epilepsy, rickets, myxedema, Addison's disease, and acromegaly are often associated with status lymphaticus.

It is now generally known that both children and adults with status lymphaticus are especially apt to die from slight external causes, such as shock, immersion in cold water, local or general anesthesia, during the course of infectious diseases, and following injections of diphtheria antitoxin. In the cases of epidemic cerebrospinal meningitis included in this series, death occurred early in the disease, distinctly modifying its course. Daut reports a series of cases of diphtheria, and states that twenty-five per cent of the patients who died from that disease had status lymphaticus.

On the other hand, we must not forget that there are a number of well-authenticated instances on record where cases of status lymphaticus have reached a ripe old age, in spite of chloroform narcosis, infectious diseases, etc. Neusser states that eunuchs, who are especially apt to have persistent thymus glands and other characteristics of this diathesis, show increased rather than diminished resistance against infection, and generally live to an advanced age.

In spite of Friedleben's dictum: "*Es gibt kein Asthma thymicum*," it is now generally accepted that thymic asthmas occurs in rare instances. The cause of the dyspnea is unquestionably the mechanical pressure of the enlarged thymus gland upon the trachea, great vessels and nerves.

Of the theories advanced to account for the sudden deaths so often observed in status lymphaticus, the two most important are the theory of mechanical compression and the theory of hyperthymization.

1. *Compression theory.* Warthin states that the following observers have reported over fifty cases in the last ten years, where death was regarded as directly due to mechanical compression of the trachea, great vessels, and nerves by the hyperplastic thymus gland,—Rollesten, Taillens, Penkert, Caillé, Perrin, de a Touche, Hochsinger, Zander and Keyhl, Tada, Rehn, Koenig, Hotz, Jackson, Hinrichs, Hedinger, Hinman, Mayer, Hait, Warthin, Rich, Rubra, Lundt, Bonner and Winkler. There is also one such case included in this series. To an impartial observer, the relief afforded by tracheotomizing a case of thymic asthma with a tube long enough to reach below the obstruction, or the immediate amelioration of the symptoms induced by the performance of thymectomy, is sufficient proof that death may be caused by mechanical compression exerted by the hyperplastic thymus gland.

2. *Theory of hyperthymization.* It is thought that the hyperplastic thymus gland throws out an increased internal secretion which renders the organism more susceptible to hostile external influences. In support of this theory, Barbarossa states that thymectomized animals offer considerable resistance to chloroform poisoning, while animals and men with persistent thymus glands succumb to small amounts of this drug.

DIAGNOSIS OF STATUS LYMPHATICUS:—In new-born children and infants, during the first year of life, stridorous breathing and severe attacks of dyspnea lead us to suspect enlargement of the thymus gland. Tracheoscopy will confirm the presence of thymic stenosis. It is worthy of note that status lymphaticus is apt to run in families. Plater, quoted by McCardie, reported in the year 1614, thymus hyperplasia in three children in the same family. All died suddenly.

Escherich and the Vienna pathologists were the first to state that they could recognize status lymphaticus by the patient's pasty complexion, by the large amount of sub-cutaneous fat, general rotundity of the limbs, and, in adults, by the absence or scant amount of axillary and pubic hair. Our cases show the same findings, and also demonstrate—as pointed out by Norris—that the hair of the head has a peculiar, dry, brittle character. In male adults, it was noted in several instances that the pubic hair ran straight across the abdomen, instead of upward in the median line, as is usual in that sex. The genital organs are apt to be small and under-developed. In addition, enlargement of the faucial, pharyngeal, and lingual tonsils is frequently present. In children, signs of rickets, and in adults, Graves' disease, are often found.

By palpation, we elicit evidence of enlargement of the external lymph-glands, cervical, axillary, inguinal or mesenteric, as well as enlargement of the spleen.

Neusser, in a monograph, states, in part, that the objective signs of the hyperplastic constitution are: Giant stature, dwarf stature, partial or complete deformity of the bones,—as in osteitis deformans and akromegaly,—abnormalities of the skull, delay in closure of the epiphyseal sutures, a pasty anemic appearance, and often abnormal fat development,—particularly in the region of the mammae and lower abdomen, and on the hips and buttocks, as in eunuchs. Neusser considers the hairiness of the individual of importance in diagnosing status lymphaticus, viz., a beardless face, hairiness of the trunk, perineum, upper and lower extremities, and the occurrence of lanugo, especially in such localities as the cheeks, back, fore-arms and calves of the legs, and the feminine type of hair-formation on the mons veneris in men. The other specific characteristics mentioned by Neusser are: a high voice, lack of prominence of the pomum Adami, small penis and testicles, small atrophic prostate, and lack of secretion of the seminal fluid.

Heart, arteries and blood. Hypoplasia of the heart and arterial system may be detected by thin and flabby walls of the palpable arteries and by the low tension pulse. A lymphocytosis or diminution of the hemoglobin of the blood may be present.

Determination of the enlargement of the thymus. Hart quotes Koenig, who states that he could see the arching forward of the thymus above the episternal notch in two cases; and Proevsing, who felt the hyperplastic thymus as a rounded tumor running under the sternum.

Absolute thymic dullness is regularly found up to the fifth year of life, according to Oestrich. Blumenreich compares this area to a triangle with unequal sides, situated rather more to the left than to the right, the base of which is located at the sterno-clavicular articulation and the apex at the level of the second rib. The sides of this triangle project slightly beyond the sides of the manubrium. According to Blumenreich, dullness which extends beyond the lateral limits of this figure for more than one centimeter denotes thymic enlargement.

In making this test, light percussion with the finger should be employed. The difficulty of diagnosing thymic enlargement by percussion may be appreciated when such a distinguished pediatrician as Dr. L. Emmet Holt states that he personally is unable to ascertain that condition by percussion. On the other hand, the

writer heard Dr. A. Jacobi remark that he could diagnose an enlargement of the thymus by percussion, but that the child must be held face downward during examination in order to bring the organ forward against the chest wall.

Radiography is highly endorsed by several writers as a certain and sure method of diagnosing enlargement of the thymus. In the first case reported above, the diagnosis of status lymphaticus was not made during life, owing to the fact that the X-ray plate did not show the enlarged gland. Considerable care and skill are necessary.

In conclusion, the writer wishes to call attention, in spite of this experience, to the X-ray examination and the general appearance of the patient, as the two most important aids toward making a diagnosis. The peculiar pasty look, the large amount of subcutaneous fat, the general rotundity of the limbs, the scant axillary and pubic hair, the under-developed genital organs, and the enlarged external lymphatic glands have been noted so frequently that they form a symptom-complex almost pathognomonic of status lymphaticus.

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137 East Fifty-fourth Street.

AN OPERATION FOR THE REDUCTION OF REDUNDANT ALAR CARTILAGES.*

BY JOHN LESHURE, M. D., NEW YORK CITY.

There is a variety of nasal obstruction which is often overlooked and which is due to redundancy of the alar cartilages. These are normally dimpled at a point half way between the base and the tip of the nose, but in some individuals the depression is so deep that the corresponding inner convex surface of the cartilage is almost in contact with the septum.

With each inspiration, the air has to pass through this narrowed channel which causes diminished pressure on the inner side of the ala, and the support of the air column, being thus removed, the external pressure depresses the ala still more, the convexity of the cartilage acting like a valve closing inward.

In many of these cases the tissues are flabby and collapse easily, so that any unusual exertion causes the individual considerable difficulty in carrying on nasal respiration; with each inspiration the valve closes more and more tightly against the septum.

The principle of the operation designed to correct this difficulty is as follows: An elliptical incision is so placed inside the nose that its axis coincides with that of the redundancy, (this is often roughly elliptical in form) and the widest part of the ellipse corresponds to the base of the hypertrophied cartilage.

The included ellipse of skin and a wedge-shaped piece of cartilage are resected and the wound-edges are sutured, the result being an eversion of the previously inverted cartilage and skin. The lining of the nose, so to speak, is shortened and the outer and inner walls are made parallel, with little or no convexity or concavity.

TECHNIC: The vibrissae are clipped short, and the skin of the nose and upper lip are scrubbed with alcohol and bichlorid. The septum is cocaineized by painting it with strong (50 per cent) cocaine adrenalin solution, and the operative area is infiltrated with cocaine 1 per cent in adrenalin 1-5000.

A curved, dental hypodermic needle is sometimes useful in reaching portions of the field inaccessible to a straight needle.

The operation is made easier for both operator and patient if the latter is in a semi-recumbent position. The electric head-lamp is a convenience, since it allows the operator to change his position easily, a decided advantage when passing the sutures. Gen-

*Read at the meeting of the Washington Heights Medical Society, New York City, October 24, 1911.

eral anesthesia may be given children and nervous adults, and a modified Junker inhaler having a curved mouth-piece adds to the ease of administering the anesthetic. The incision has already been described, and one must calculate carefully beforehand the amount of tissue to be removed.

If the wound-edges do not come together without tension, the flaps should be loosened from their attachment to the surrounding tissues by a few snips of the scissors.

The passing of the sutures is rather troublesome, but the work is made easier if one has an assistant. The most satisfactory needles I have used are those devised by Lane for cleft-palate work; they are very sharp, going through the skin easily, have a large eye, so they are easily threaded, and a very sharp curve (radius of curvature about $\frac{1}{4}$ -inch) enabling one to pass them readily even in a narrow nostril.

When the obstruction is situated rather far back it is sometimes more convenient to introduce the sutures with the straight needles of Lane. These are about $\frac{1}{2}$ -inch long and can be grasped near the eyes in such a manner that the needle forms an angle of 45 degrees with the holder. The sutures are passed from behind forward, the needle holder being next to the septum.

This method of using these short, straight needles works well in suturing the incision for the sub-mucous resection of the septum. The needle should be passed first entirely through the posterior flap, then re-adjusted in the holder and passed through the anterior flap, as it is difficult to engage both flaps at once.

A delicate needle-holder is required and the one designed by Stevens for eye-work fulfills the requirement very well.

No. 5 black braided silk is an ideal suture material and passes more easily through the tissues if treated according to the method of Worth, as follows: After having been boiled and dried the silk is drawn through a very hot mixture of white beeswax three parts, and white vaselin five parts. It is then kept in a sterile container until used. This preparation renders the suture less permeable to fluids and prevents, in a measure, a stitch abscess.

The after-treatment is simple, no packing is necessary, but the wound surfaces are kept smeared with 5 per cent boric acid ointment.

The sutures are removed on the fifth day or earlier if stitch-abscess develops. Primary union is the rule and the results are most satisfactory.

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VINCENT'S FUSIFORM BACILLUS. EXPERIMENTAL RESEARCHES.

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Very little has been written about Vincent's fusiform bacillus, and the results of experimental research are contradictory. After the first description of it by Plaut, Veillon and Zueber studied it accurately in culture media; Lewcowitz and Ellermann developed it in agar and horse serum. But none of these experiments went beyond the studies of the cultures.

On the other hand, Leiner, Rupaci, Ghon and Mucha have carried on investigations as to the chemical and biological character of this bacillus, and have found the following to be true: It is stained by Gram and by anilin dyes; it is non-mobile; in glucose-agar it develops after twenty-four hours, the colonies appearing as greyish dots; it rarely produces gas; it acidifies milk without coagulating it; it does not decompose the white of a boiled egg; produces indol; decomposes sugar; is pathogenic for guinea-pigs and for mice. Bacteriologists, however, do not agree on the degree of pathogenicity nor on its specificity for Vincent's angina.

Its pathogenicity as found by Veillon and Zueber, was low; according to Lewcowitz, Ellermann, Leiman and Boux, it is high; Rapaci states that its pathogenicity is medium, and Ghon and Mucha that it is very low. Vincent and Dopter feel that it possesses a specific activity, owing to the fact that they have observed an ulcerous stomatitic infection with fusiform bacilli in soldiers who had used the same pipe. Perthes and Silberschmidt are of the same opinion, for by injecting into a rabbit some noma tissue they obtained a localized necrosis. Ellermann recently asserts the specific nature of this microbe in necrosis, and pointed out that it is found at the border of the necrotic area.

In order to determine definitely the thus far poorly defined biological properties of the fusiform bacillus, I have collected material from patients consulting me at the laryngological clinic at Turin, in whom necrosis was apparently due to Vincent's angina. But in only one case have I been successful in isolating this bacillus in a culture.

My method in each case was as follows: The patient was left without medication for several days; every day I collected material

by scraping the ulcer in different parts; I colored the specimens with Zihl and with Gram stain; when sure of the presence of Vincent's bacillus in such a quantity as if it were in pure culture, I used the specimen for my research work. I then passed the substance collected from the ulcer into a sterile physiological solution by means of a loop, drew it into a long, thin, pointed tube and introduced it into the culture. For the development and isolation of the colonies I used glucose-agar, prepared according to the formula of the Institute Pasteur, i. e., 600 grams of beef minced and boiled for ten minutes in a liter of water, afterwards adding one per cent of peptone, or five per cent of NaCl. and 1.5 per cent of agar. After the temperature has descended to 45° C., the white of an egg beaten with water is added, and then some lactose and glucose at 4 per cent. The culture was vertically distributed in large, long tubes, half-filled. To grow the colonies I took them from the physiological solution with a pipette and introduced them into the floor of the tubes containing glucose-agar. These tubes had been previously warmed in "bain marie" at a temperature of 100°, and were at a temperature of 30° to 40° at the time the colonies were introduced. Immediately afterwards the tubes were cooled in ice in order to expel any air-bubbles that may possibly have formed. Having placed the tubes in an incubator (temperature 37°) I noted the development of the colonies at different heights in the tubes, differentiating between the aerobic and anaerobic.

In eleven cases I was unable to isolate the bacillus, because of the presence of innumerable micro-organisms in symbiosis, especially pneumococci, streptococci, staphylococci, and Vincent's bacilli.

In one case in which the tonsillar ulceration had continued for four days, and was surrounded by a necrotic peripheral area, which had a fetid odor characteristic of angina, I succeeded in collecting a yellow, greenish slough (dense pus), which I stained and examined, and in which I found a profuse number of fusiform bacilli united in masses; other micro-organisms were scarce. By employing the above-mentioned method I was able to isolate the bacillus and could thus study closely its cultural and biological characteristics.

The colonies which developed at the bottom of the glucose-agar tubes emitted a very disagreeable odor, and after being kept for some days in an incubator at a temperature of 37°, appeared as little dots with brown centers and of a flaky, lighter color. When the bacilli were passed into broth they produced large flakes; in milk they precipitated caseine; they did not peptonize gelatine, nor

ferment sugar. The bacillus was readily colored with analine, and the Gram stain; it was non-mobile and without flagella, measured six to eight micra in length and three to four micra in width. Injecting the fifteen days' culture into animals never produced death, but merely a localized necrosis. I also took sloughing masses from the ulcerated surfaces of the anginas, and inoculated them into the mouth and skin of guinea-pigs; thus I obtained extensive rapid, necrosis at the site of injections.

These experiments with the fusiform bacilli clearly demonstrate several interesting facts regarding its biology: It lives in symbiosis with other micro-organisms in the microbic ulcer and together with them determines the initial lesion; after a few days it dominates, and sometimes maintains the lesion. It is possible to cultivate and to isolate it if it be present in large numbers. Since necrosis can be produced in animals it is evident that in necrotic angina, the fusiform angina plays the principal part in the development of the disease. But since guinea-pigs inoculated with necrotic tissue show more serious and more rapidly developing lesions than those in whom the fusiform bacillus alone was injected, and because in the primary stage of the ulcer Vincent's bacilli are scarce and the other micro-organisms numerous, we must conclude that to the latter are due the initial lesions and the increase in the pathogenic power of the bacillus during the course of the ulceration.

Vincent's bacillus may be regarded as specific for necrotic angina, since it alone can produce necrosis (as has been proved by experiments on animals) and since in man pharyngeal ulcers assume necrotic characteristics after its appearance.

Royal University.

Papilloma of the Larynx; Malignant Transformation. Operation; Thyrotomy; Laryngotomy; Laryngectomy. E. J. MOURE, *Rev. hebdomadaire de Laryngol. d'Otol. et de Rhinol.*, Jan. 27, 1912.

The title indicates the successive operations undertaken for the relief of the patient, the last being apparently successful, but was followed four months afterwards by recurrence. The operations were performed under local anesthesia (cocain 3½ per cent) and the author calls attention to the advantage and safety of this method.

SCHEPPEGRELL.

A CASE OF SCLEROMA.*

BY SAMUEL IGLAUER, M. D., CINCINNATI.

Scleroma (rhino-scleroma) occurs endemically in Russian Poland and Galicia, where it is a common disease. From these centers it has spread into contiguous German and Austrian territory, while scattered cases have been reported throughout the world. German statistics show a total of fifty cases, (Gerber¹). In the United States, rhino-scleroma is a very rare disease. Emil Mayer² has collected reports on a total of sixteen cases, and states that no authentic case has originated in this country.

The disease is characterized by granulomatous infiltration (Pienazek³), affecting especially the mucous membrane of the nose or of the naso- and oro-pharynx; more rarely of the larynx and trachea. The granulomata gradually undergo transformation into connective tissue, leading to marked stenosis of the affected parts.

For many years the encapsulated bacillus of Frisch (resembling Friedlander's bacillus) has been regarded as the exciting cause of the disease, but only within the past few years has the true nature of this bacillus been proved through the discovery by Goldzieher and Neuber⁴ of specific antibodies in the serum of scleromatous subjects.

REPORT OF CASE.

The case which I present to-day is that of R. T., female, aged 28 years, married, who first came under observation, November 20, 1911. She was born in Russia and emigrated to the United States in 1906. Her family history is negative except that one of six sisters is said to have the same disease. Her husband is said to be in good health. The patient has conceived four times and aborted during her second pregnancy. She has three living children, two of whom I have examined and who present no evidence of the disease.

Her *chief complaint* is nasal obstruction and difficulty in swallowing. The present trouble began during her girlhood and has slowly grown progressively worse.

Examination.—Nose contains some muco-pus. The middle turbinates on right and left are somewhat hypertrophied. The lower turbinates somewhat shrunken, but with normal contour and sur-

*Read at the meeting of the Middle Section of the American Laryngological, Rhinological and Otological Society, Cincinnati, February 22, 1912.

face. In the pharynx the anterior pillars are of normal appearance, the tonsils are somewhat atrophied and the post-superior portions are covered with a thin, grayish-white web, which is continuous with the posterior pillars. The latter are cicatrized, grayish-white in color and are drawn upward, backward, and medianward from their normal position. The velum is thereby pulled upward and backward, and is held firmly, so that it cannot move on phonation. The passage from the oro- into the naso-pharynx is so narrowed that it will scarcely admit the tip of the index-finger. The uvula is not visible, probably being rolled up on the posterior surface of the velum. Posterior rhinoscopy cannot be carried out. A small granulomatous area at the front corresponding to the base of the uvula was removed for microscopic examination. The larynx shows no abnormalities. Both Wassermann and Nogouchi tests were reported negative by Dr. O. Berghausen (February 17, 1912).

The microscopic findings by Dr. Herbert Brown were as follows: The Specimen:—A piece of granulation-like tissue, about $\frac{1}{8} \times \frac{1}{4} \times \frac{1}{4}$ inch. This tissue cut with very slight resistance. Dividing the specimen into two parts, one was prepared after Levadictis' method, mounted in paraffin and cut serially. The search for spirochetes was negative. The other part was also mounted in paraffin and cut serially. The sections were cut to a thinness of five microns. They were stained in carbol-thiomin and differentiated in 80 per cent of alcohol.

The microscopic picture was about as follows:—There is quite a scarcity of cellular elements, the larger part of the section showing a network of more or less fibrous strands with an occasional muscle bundle. There were a few vessels, all empty. Large rosette-shaped cells were seen lying in the meshes of the above-mentioned network. In these cells were found a few small diplococci.

Occasionally a large, densely-stained cell of regular outline was seen. Some of these cells contained bacteria (diplococci), while others were free from them. These cells are the Mikulicz cells, supposed to be characteristic of rhino-scleroma. The bacterium present is a small diplococcus similar to the Friedlander bacillus. It shows in some instances a faintly marked capsule. For the most part these bacteria lie free in the stroma of the tissue, arranged in clumps. There are some intra-cellular bacteria as mentioned above.

Therapy:—Until recent years the treatment of scleroma has been very unsatisfactory and has been directed chiefly towards overcoming the mechanical obstruction. Excellent results have recently

been obtained by the use of radiography (Zwillinger⁵) and the outlook for these cases appears much more hopeful.

Dr. S. Lange has given three peroral X-ray treatments, each of eight minutes' duration. This number of exposures is insufficient and as yet no benefit is to be expected, especially since this seems to be an arrested case in the cicatricial stage.

Owing to the contagiousness of this malady, all cases should be detected and treated, and preventive measures should be employed to limit the spread of the disease.

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22 West Seventh Street.

Tinnitus and Aural Vertigo due to Uric Acid Diathesis. KAUFMANN. *Rev. Hebd. de Laryngol. d'Otol. et de Rhinol.*, April 20, 1912.

The patient, a woman of 32, had suffered from tinnitus for six years, gradually becoming worse until it was almost intolerable. Bromid and iodid of potash in large doses were of no benefit. Recently, attacks of vertigo had developed.

An urinalysis showed a considerable excess of uric acid. A thorough treatment of this diathesis resulted in a general improvement in the health of the patient, and a complete cessation of the tinnitus and vertigo. Kaufmann claims that the symptoms of the patient were due to an endarteritis of the vestibulo-cochlear artery. There was no deafness as there was no obliterating endarteritis. There was undoubtedly an incomplete ischemia which caused the tinnitus in the cochlear area, and vertigo in the vestibular area.

SCHEPPEGRELL.

A CASE OF LINGUAL THYROID.

BY GEORGE FETTEROLF, M. D., PHILADELPHIA, PA.

Mr. A. J. F., aged 34, salesman, suffering from pulmonary tuberculosis, was a patient at the White Haven Sanatorium, and while there improved greatly both as regards his pulmonary condition and his general health. He had no trouble with his throat until five weeks before appearing at the writer's office, and then only after he had made a trip to Philadelphia. On reaching the city, after a three and one-half hours' railroad trip, he noticed that he was hoarse, a condition which lasted for two days and then disappeared. Returning to White Haven, he had no trouble except hoarseness, which appeared in the evening, and lasted for about one hour. This gradually disappeared and left his throat in its usual condition. His upper air-passages were examined once at White Haven, and on finally leaving the sanatorium and returning to his home he was referred to the writer for further examination and treatment by his physician, Dr. F. A. Craig.

At this time the patient was a fairly well-nourished individual with the clear, ruddy skin, so characteristic of those constantly exposed to cold air. He stated that beyond the hoarseness noted above, his voice had never troubled him, except for a certain thickness which had been present since childhood. He had had no pain, no dysphagia, no dyspnea and, until his throat had been examined with a laryngoscope, no idea that there was present anything structurally abnormal.

On looking into the mouth, either with or without the aid of a tongue-depressor, nothing unusual could be seen. When the tongue was protruded and held in that position there came into view a large, rounded swelling, situated far back on the tongue. Examination by means of a laryngeal mirror showed that it lay just anterior to the epiglottis, which, while entirely independent of the growth, was tilted back by it so far that a view of the interior of the larynx was not obtainable.

The tumor presented the following characteristics:—It was hemispherical in shape, and measured about six centimeters in both its transverse and antero-posterior diameters. It was of about the same shade of red as the deepest colored part of the faucial pillars and was perfectly smooth in contour. It ended abruptly at its

*Read before the Section on Laryngology and Otology of the College of Physicians of Philadelphia, 1912.

periphery, giving the impression that there was more of it in the substance of the tongue. It did not extend beyond the confines of the tongue and its posterior termination was at the base of the supra-lingual portion of the epiglottis while the anterior margin was about on the line with the anterior pillar of the fauces.

Over its surface coursed in a sagittal direction numerous engorged veins, such as are frequently seen at the base of the tongue in the form of a lingual varix. These vessels originated from, or rather were tributary to, a marked venous arch situated just above the anterior part of the periphery of the growth. (This arch is well shown in the mirror in the appended sketch.)

On palpation the tumor was firm and cystic, and when two fingers were used there was a decided feeling of tense fluctuation, but of too torpid a nature to be characteristic of any ordinary fluid. The cervical lymph nodes were not enlarged.

When the question of diagnosis arose, the following were considered:—malignant growth, benign growth, cyst, chronic tuberculous abscess and accessory thyroid.

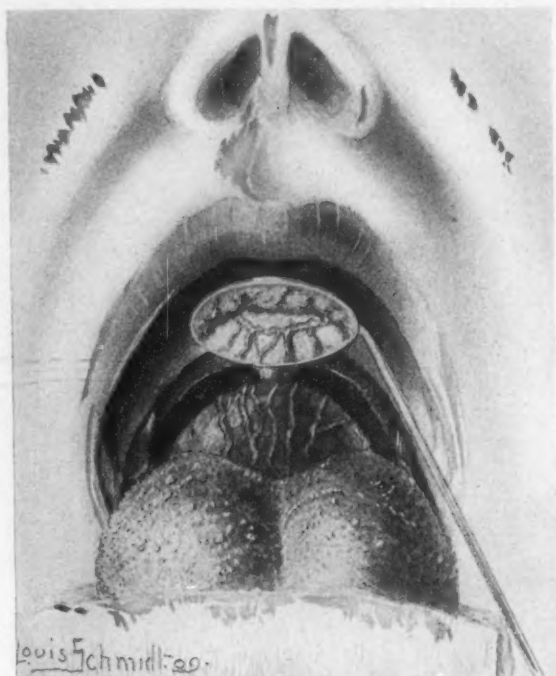
Malignant growth was dismissed on account of the age of the patient, the essential chronicity of the condition, the lack of pain, and the absence of enlargement of the cervical lymph nodes.

Benign growth was a possibility, but was not considered long on account of the smooth softness of the growth, combined with the total absence of pain, dysphagia and dyspnea, and the utter insensibility of the patient to the fact that there was anything abnormal in his throat.

Cyst was favorably considered on account of the smoothness of outline of the growth and the suggestion of fluctuation. To determine this question the needle of a syringe used for the injection of local anesthetics into the tonsil was bent at a right angle and on three different occasions plunged into the tumor, and the piston withdrawn slowly with the needle in position. A new spot away from an engorged vein was chosen at each session and the needle inserted to a depth of at least one centimeter. All three of the tapplings brought nothing more than a small amount of blood. After each exploration bleeding would be profuse for a few moments, and then would stop quite abruptly, leaving the growth markedly paler than before. The result of these procedures was the elimination of the possibility of the tumor being a cyst.

Cold abscess was excluded by the evident long duration of the tumor, the absence of symptoms and the results of exploratory puncture.

The diagnosis of accessory thyroid was finally made on the following grounds:—The situation of the swelling was characteristic, being not only median and symmetrical but also at the base of the tongue. As is well known, the thyroid body is developed from three "Anlagen," a median and two lateral. The median is an epithelial outgrowth from the anterior wall of the primitive pharynx in the region of the second visceral arch, and hence in close relation to



the base of the tongue. At first it has a narrow lumen, which soon disappears, the mass becoming solid and of a pyriform shape. For a time it retains a connection with the pharynx by means of a slender cord of cells, which usually disappears, leaving only the foramen cecum at the base of the tongue as a reminder of its former presence. The principal part of the median cell-mass then descends as a bilobed structure to the level of the fourth visceral arch, where it joins with the lateral "Anlagen" to form the completed thyroid body. A median posterior situation, therefore, would

be characteristic of an accessory thyroid, the result of a persistence in original position, and a development there of the median "Anlage."

The semi-fluctuating sensation imparted to the fingers was another point. The thyroid is made up of soft alveolar tissue surrounded by a firm capsule, which consists of both fibrous and elastic connective tissue, and this combination is one well calculated to impart the feeling of fluctuation.

The main impression which was created in looking at the growth was its chronicity. This appearance was caused by a lack of any unconscious resistance to examination, the absence of any undue congestion and the presence of the large, engorged veins over the surface of the growth. The last condition is stated by Von Bergmann to be characteristic of the form of growth under discussion.

The extent of the chronicity was thought to be life-long and the condition congenital on account of the lack of subjective symptoms, such as pain, and the interference with speaking, swallowing and breathing, together with the quality of the voice. Speech was distinctly thick and muffled, resembling to a slight degree the kind of speech produced by enlargements of the tonsils, particularly quinsy. The patient stated that his voice had always been of this character.

A diagnosis having been made and explained to the patient, the question as to whether or not to operate naturally arose. A decision not to interfere was reached on the grounds that the patient's condition in general was not of the best; the existence of tuberculous pulmonary infection would render an anesthetic, particularly ether, inadvisable; an operation to be thorough would be long, bloody and exhausting; the tumor had caused no trouble and was not growing; and there was the possibility of myxedema supervening upon the operation. In this connection, Smyth quotes Lenzi to the effect that myxedema developed in twenty-two per cent of the cases from which the growth was removed.

The literature of this subject has been reviewed recently by H. E. Smyth in an article in the *Annals of Otology, Rhinology and Laryngology*, Vol. 20, June, 1911, page 367. He reports three cases of his own, bringing the total of reported cases up to sixty-seven. Of these, six were in males and sixty-one in females. A great majority of the reported cases occurred between the ages of 15 and 45 years. Smyth states that this is probably due to the fact that during this age the thyroid body is at its highest point of functional activity. While this may be the case, I am inclined to believe that the condition, when present, exists throughout life, and the greater

number is found at the age mentioned, because the majority of our patients are seen and carefully examined during this period.

The mucous membrane is stated by Smyth to be darker and more vascular than that of the tongue. This was true in my case, the color having been about that of the dark area of the anterior faucial pillar. In two cases the mucous membrane was eroded.

Fluctuation, according to Smyth, was absent. In my case there was a decided feeling of fluctuation, due probably, as explained above, to the character of the tissue comprising the growth and its capsule.

Three deaths have been recorded. In one the tumor pressed on the epiglottis and caused asphyxiation in a new-born child. In a second, a child, which had never breathed, was found to have a large growth at the base of the tongue, pressing upon the epiglottis. The third was a child which died of myxedema at the age of 6 months, no operation having been performed. In two cases the tumor was found at autopsy, death having resulted from some other cause.

It will be noted that death was caused only twice by the mechanical pressure of the tumor and that both of these occurred in infancy. The feeling of the writer is that, when one considers the innocuousness of the tumor, the possibility of there being present in the body no other thyroid tissue, the remote possibility of the tumor enlarging, the tolerance to its presence of its possessor, the gravity of an extirpation and the real danger of myxedema following removal, such growths, unless threatening the integrity of the respiratory or alimentary tracts, had best be left undisturbed.

330 South Sixteenth Street.

Epithelioma of the Epiglottis. Removal by the Trans-hyoidian Route. E. J. MOURE, *Rev. hebdomadaire de Laryngol., d'Otol. et de Rhinol.*, Jan. 27, 1912.

In spite of the patient's age (71 years) the result was satisfactory. Seven months afterwards the patient showed no evidence of recurrence. As a result of the operation the orifice of the larynx was elongated in the antero-posterior diameter. SCHEPPEGRELL.

ACUTE INFLAMMATION OF THE THYROID GLAND.*

BY OTTO J. STEIN, M. D., CHICAGO.

(It has recently been noted by writers on this subject that investigation of the literature has shown that very scant recognition has been given to acute thyroid inflammation, and especially by those in our specialty. It has been my experience, that the laryngologist has a special opportunity to observe such cases where they exist.)

The almost barrenness of our literature on this subject attests to its comparative infrequency, but the subject is of absorbing interest because of the seriousness of many of these disorders and also owing to the difficulty in diagnosis.

An acute inflammation of the thyroid may take place in a gland perfectly normal, or in an enlarged or goitrous one. To distinguish the two, some writers designate the former as thyroiditis and the latter as strumitis. All or only a part of the gland may be involved in the inflammatory process. An accessory or an aberrant gland may be inflamed without the main or parent gland being particularly affected.

From the cases reported in the literature, it appears that the thyroid of the female is more frequently involved. It may occur at any age of life, although the greater number appear between the twentieth and fortieth year. It has been reported as occurring at times as an endemic. W. S. Robertson states that in Switzerland it is recorded as occurring as an endemic in school children and in France in a military garrison. It most usually takes place in an existing large gland and at times occurs in the course of pneumonia, influenza, eruptive diseases of childhood, typhoid, diphtheria, erysipelas, mumps, malaria, rheumatism, tonsillitis, lues and tuberculosis. It also has occurred after injury or operation on the neck. Such a case was reported to me by a colleague as following a laryngectomy and it terminated in death from the acute thyroidism. Lubbinski believes iodine may be a cause, although this is denied by Goldberger. De Quervain also believes in a iodo-thyroiditis because he speaks of a bacterial and toxic variety.

The inflammation may terminate in resolution or go on to supuration. In the latter the disease always assumes a more serious

*Read before the meeting of the Illinois State Medical Society, Springfield, Illinois, May 22, 1912.

aspect. Sixty per cent suppurate and of these twenty per cent die, (Lebert). A simple inflammation is only rarely fatal, while the suppurative variety is always serious and, as stated, quite often terminates in death. This is due to the prolonged sepsis and the occurrence of pus finding its way under the deep cervical fascia into the mediastinum, or by opening into the air or food tract. Should gangrene arise, which seems to be rare, it is always fatal. If the abscess-formation tends to the surface, it is more easily evacuated and the disease assumes a less serious nature. Being a ductless gland, the avenues of infection presumably are the blood and lymph streams. The nature of the micro-organism is usually identical to that of the associated disease.

Robertson, in a collection of ninety-six cases, found that in forty-one, suppuration resulted and these occurred only in the pneumonia, puerperal, typhoid, diphtheria, and erysipelas cases. Bahri reports a case of suppuration following influenza and Bauer one following scarlet-fever, while one of my cases followed tonsillitis with a rheumatic history. Collet relates a case in an 18-months-old infant following pertussis, the pus containing streptococci. Hager cites an acute non-suppurative thyroiditis of his own observation in connection with a duodenal ulcer. Typhoid appears by far the greatest etiologic factor. McArthur states out of seventy-three cases of thyroiditis, forty were typhoid complications. Trauma is also a causative factor, as the infection following the hypodermatic treatment of the enlarged gland.

The symptoms of an acute inflammation of the thyroid gland will vary somewhat with the absence or presence of pus. Both varieties have the usual symptoms of an ordinary febrile disease, like chilliness, high temperature, dry and hot skin, anorexia, constipation, maybe nausea and vomiting, and perhaps some headache.

These symptoms, occurring as they do frequently during or at the termination of one of the associated diseases mentioned above, may lead to the belief of a recurrence of that particular disease. But when the following focal symptoms begin to appear, suspicion should be aroused. Pain in the neck in or around the region of the gland, at times radiating towards the ears and the scalp back of the ears from pressure on the auricularis magnus nerve; pain on swallowing; the swelling in the front of the neck becoming noticeably increased in size so that movements of the neck are painful and to obviate which the head is usually held stiff with the chin down to relieve the tension; the pressure inward on the larynx and trachea may cause huskiness and even aphonia, cough and possibly

blood-stained expectorate owing to a passive congestion and an edema. A pressure on the esophagus may even cause actual difficulty in swallowing aside from the pain incident to the inflammation of the neck. This is also the cause of the thirst. Vomiting, with a slow pulse, may be present from pressure on the vagus nerve. Sometimes a partial ptosis and corneal anesthesia are present from sympathetic nerve-pressure. Atrophy of the remaining gland after a suppurative process has been reported as causing cretinism.

The diagnosis, particularly in the suppurative variety, may be difficult. A beginning thyroiditis may be confounded with any simple parenchymatous or colloid enlargement such as is frequently met with in girls at puberty or during menstruation or pregnancy, especially with an incidental occurrence of sore-throat.

A case of Ludwig's angina seen by me resembled very much a suppurative thyroiditis, but the involvement of the tissues of the floor of the mouth in this patient determined the correct diagnosis, just as the absence of involvement of this area turned the evidence toward suppurative thyroiditis in another patient of mine.

Cervical adenitis accompanied by cellulitis has many characteristics of thyroiditis. Mumps and esophageal abscess are mentioned by McArthur as simulating this disease.

Thyro-glossal and branchial cysts resemble somewhat this condition. I operated such a cyst in a young boy in which there was fever, severe pain in the neck, great swelling in the mid-line, redness of the skin, fluctuation, rigidity of the head and difficulty in swallowing. On opening, nothing but a quantity of mucoid fluid was found within the cyst wall and forceable injection of the cavity found its way along the patent duct to the foramen cecum at the root of the tongue. A second case was a lady, 31 years of age, complaining of chronic sore-throat. She gave a history of having had a swelling over the larynx that was red and painful and was accompanied by fever. The swelling was incised, at that time, a year before, and a large quantity of pus escaped. A small scar in the median line now remained. The right faucial tonsil showed pus escaping from numerous crypts. The tonsils were not acutely inflamed, but buried and diseased. I removed them by dissection. Six months later she again consulted me regarding a swelling in the region of the old scar. It gradually increased and became very painful on swallowing and otherwise. The scar finally opened and a purulent discharge continued from the fistula for some months.

Disease of the submaxillary and sublingual salivary glands, especially with calculi, accompanied by infection and pus, may

bring the diagnosis into question. Ranula is another one of those conditions which, if very large, may have to be considered. But both of these affections always show marked involvement of the floor of the mouth especially on palpation.

Quincke's disease, or, as more correctly known, angio-neurotic edema of the throat may be present as a symptom of the thyroiditis and thus exaggerate conditions. Kyle refers to the high leucocyte count in this neurosis and considers it an aid in differential diagnosis.

Hemorrhage into the gland had been recorded a few times and may simulate a sudden attack of thyroiditis. Bruening, in reporting such a case which resulted following the firing of a gun, refers to six other cases reported in the literature. Champion and Aldridge also report an interesting case that died within one and one-half hours following a fall from a tram-car. Dr. Cubbins, of Chicago, related a case to me of acute hemorrhage in the gland that recovered after operation.

A gumma of the gland may take on sudden activity and provoke some acute symptoms such as severe dyspnea, edema of larynx, hoarseness and dysphagia, but this is the exception, judging from the few cases reported in the literature, about twenty in all.

Chondritis and perichondritis of the various causes like typhoid, lues and tuberculosis may have to be considered, but other evidences of these diseases are usually so apparent that a differential diagnosis is not difficult.

A typical case of acute inflammation without suppuration that came to me was a young girl of 15 years of age. Very suddenly and without any known cause, the thyroid gland enlarged and as it rapidly increased in size it produced pressure-symptoms, such as difficulty in swallowing, local pain, a huskiness (due to a mild edema of intra-laryngeal membrane seen on laryngoscopic inspection) that necessitated a "clearing of the throat." Associated with these were the usual symptoms of infection, such as chilliness, hot and dry skin, anorexia, constipation and headache. The temperature went as high as 102° F. and then gradually receded. The area of thyroid swelling increased, the overlying skin was red, glazed and very painful. The pressure-symptoms increased so much as to interfere very disagreeably with swallowing, breathing and the voice. There was no vocal paralysis or stenosis from compression, only edema. General nervous symptoms were present, such as fear, restlessness, accelerated pulse and respiration. Ice and kaolin paste were employed locally and after ten days she was well.

Another patient of mine, one of the suppurative variety, presented several interesting features. She was a young lady, 26 years of age, with the following history:

She had been under the care of several physicians for eight weeks. Two of them were throat specialists, and one an osteopath, but her trouble became progressively worse; she suffering much and was greatly discouraged. At the beginning a swelling developed in the neck, slightly to the left of the mid-line between larynx and chin. It appeared rather suddenly and continued to increase. It remained circumscribed to this area and was painful. The trouble commenced with acute symptoms, like fever, a mild tonsillitis, soreness and stiffness of the neck, hoarseness of the voice being an early symptom. The dysphagia developed only in the last week or so. Owing to symptoms, referred to by the patient as rheumatic, most all of her physicians had been treating her for rheumatic laryngitis. There was no dyspnea nor cough.

My examination revealed the features of a woman in much distress. There was evidence of much pain, and in order to minimize this, she held her head rigid. The pain even then was constant but became worse on swallowing and even talking, and it radiated at such times toward and into the ears.

The anterior part of the neck was much swollen so that there was a straight line from chin to sternal notch. The skin was tense and somewhat glazed, the underlying tissue hard and painful and no evidence of softening could be determined. The temperature was 100° F. The oro-pharynx showed nothing abnormal. The base of the tongue and epiglottis appeared normal. The interior of the larynx was not inflamed although both ventricular bands were very much swollen, the vocal cords themselves being clean, white and freely movable. The floor of the mouth on palpation and otherwise showed no involvement of the salivary or mucous glands in this region.

On the following day the patient was operated upon at the hospital by a transverse incision made over the region of the hyoid membrane. This site was selected because the onset of the swelling seems to have developed in this region; because of the swelling of tissue in the supra-glottic region, and not below; and finally, because at the time of the operation, I found slight softening at this place, which was not made out the day before. Pus was encountered in considerable quantities very deeply undermining the tissues all about. A curet was used for the purpose of securing some tissue for examination and this showed, with the microscope, evidence of thyroid tissue. The pus contained streptococci. A gauze drain

was used for several days and a large quantity of pus continued to drain, but all other symptoms immediately improved so that ten days later the patient was discharged healed and well and has remained so. I believe this to have been a case of thyroid inflammation first involving the pyramidal lobe. (I have seen this disease develop following influenza and tonsillitis, but only exceptionally does the process go on to suppuration.)

In one case, an acute suppurative process developed as a result of direct injury. A boy was riding a bicycle and carrying over his shoulder the frame of another wheel; he fell from his wheel, the frame of the one he was carrying struck him in the neck over the gland, and a severe edema of the glottis shortly followed, which was relieved by local measures. The same evening, the gland began to swell and enlarge, it became very painful and a temperature of 104° F. developed, with chills. All the local symptoms increased, and on the seventh day an incision low down in the neck had to be made, and a small amount of pus escaped. After this his recovery was rapid.

(The intra-laryngeal and tracheal changes in the various affections of the thyroid gland are always of great interest, especially to a laryngologist, but in the particular variety of thyroid disease under discussion the changes within this tract are not so numerous. Personally, I have never seen or authentically heard of cord-paralysis as a result of thyroiditis, although hoarseness and even aphonia and dyspnea are frequently present, due to the venous congestion and edema. The edema is usually in the supra or infraglottic region, but not of the cords. Compression of the trachea is likewise not reported in this class of cases, while cough, "clearing of the throat," blood-stained expectorate and laryngeal spasms are present in some cases.)

32 North State Street.

The Nervus Vestibularis. W. REEDER, *Jour. of Ophth. and Oto-Laryngol.*, May, 1912.

The paper is a brief review of the generally accepted anatomical facts regarding the origin, course and distribution, together with the reflex paths of one division of the eighth nerve—the ramus vestibularis.

STEIN.

BLACK HAIRY TONGUE (LINGUA VILLOSA NIGRA): REPORT OF TWO CASES.*

BY WILLIAM WESLEY CARTER, M. D., NEW YORK CITY.

The name, black hairy tongue, has been adopted by me for this condition, which has been described under no less than sixteen different names, for the reason that it gives at once a clear idea of its chief physical characteristics, namely, the dark, hairy appearance of the tongue. Since both the etiology and pathology are surrounded by considerable uncertainty, no name founded upon these would be generally accepted.

The condition was first mentioned by Amatus Lusitanus, in 1557, who noticed on a man's tongue, black hairs, which came back after they had been pulled out. In 1836, Rayer reported a case, and in 1869, Raynaud published a scientific paper on the subject, in which he described the microscopical appearances of the disease. In 1909, (*THE LARYNGOSCOPE*, July, 1909), Dr. H. Arrowsmith described his own case before this section. In Dr. Arrowsmith's case, the hairy spot was located to one side of the median line, which is contrary to its usual distribution. In 1910, (*Annals of Otology*, September, 1910), a case was reported by Dr. Chas. H. Knight, who suggested a possible functional disturbance of the sympathetic nerves as an etiological factor.

In 1907, (*Fraenkel's Archiv*, Vol. 20), Blegvad, in a very complete treatise, brought this subject up to date, and added ten cases of his own to the 128 previously reported. Since this time numerous cases have been recorded.

The following general description will practically cover all of the cases reported: On the back of the tongue of an otherwise healthy person, there is seen a spot, brownish or black anteriorly and gradually shading off to a grayish-yellow posteriorly. This patch appears raised above the general level of the tongue, and as a rule it is symmetrically placed on either side of the median sulcus, reaching from about one-half inch in front of the circumvallate papillae forward to a greater or less distance from the tip. The hairs, which are composed of hypertrophied and elongated filiform papillae are from one-fourth to one-half an inch in length, and point towards the tip of the tongue. A spot may be on the side or tip, or the

*Read at the meeting of the Laryngological Section of the New York Academy of Medicine, January 24, 1912.

entire tongue may be covered with hair. The appearance of the spot has been appropriately likened to a wet black-haired dog. When the hairs are teased up with a probe, it is seen that only the tips are black, and that they shade through brown to light yellow or grey at the base. The hairs, when scraped off, are seen to be hypertrophied and elongated filiform papillae, and differ from normal papillae only in size and length, and in the discoloration near the tips. According to Blegvad, the epithelial cells are arranged on the papillae like the tiles on a roof. The center of the papilla is composed of polygonal cells. There are present many pointed, spindle-shaped, keratosed cells which have more or less degenerated nuclei. Large numbers of various kinds of bacteria are seen, as well as pear-shaped, clear bodies having a high refractory power, which are probably spores of mould.

The course of this disease may be acute or chronic, and may vary in duration from a few days to fifteen years (Sell's case). In many instances the disease is intermittent; this is probably so in most of the chronic cases.

First a white spot appears; this is composed of elongated filiform papillae. In a short time this is stained brown or black, probably by the food, drugs, tobacco or mouth-breathing.

It is claimed by some that there is a connection between this affection and some so-called principle disease, such as gastritis, chronic constipation, syphilis or tabes. By these men, black hairy tongue is considered only a symptom. In my cases I could discover no such connection; and therefore I cannot accept this view.

The disease occurs far more frequently in men than in women, and the great majority of these are excessive tobacco smokers; practically all writers acknowledge the etiological importance of tobacco. Most of the cases have occurred in middle-aged people. In a number of instances the patient was suffering from some chronic complaint, but this does not establish etiological relations, for the affection occurs in those who are otherwise perfectly healthy.

Ciaglinski and Hewelke were the first to suggest that black hairy tongue was due to the growth of a black mould. In 1893, Schmiegelow and Sendziak succeeded in cultivating a black mould on wheat-bread gelatin. They called it *mucor niger* and regarded it as the specific cause of the disease. Other observers have been unable to associate the disease with this germ, and many of those who formerly adhered to the parasitic theory, including Schech, have abandoned it, and now favor the view that it is a hyperkeratosis of the filiform papillae. In six cases reported by six men who be-

lieved the condition due to moulds, there were six different moulds discovered and each man believed that his was the true etiological factor in the disease. When we think of how many different kinds of bacteria are found in the normal mouth, (David found nineteen and Mills found twenty-five), we can appreciate how difficult it is to isolate and identify as the etiological factor any one germ. As a matter of fact, no case has yet been reported in which it was shown that the disease was due to any particular germ, and no man has yet been able to meet the scientific requirements necessary for this affection to be established on a parasitic basis, by isolating the germ, cultivating it and reproducing the disease in another animal.

Most recent investigators have accepted the theory originated by Schech, in 1887, that black hairy tongue is due to a hyperkeratosis of the epithelium of the filiform papillae.

Personally I believe that the affection is due to a local nutritive disturbance, and the growth of the filiform papillae is similar to that of papillomata in other parts of the body.

There is no single severe symptom that can be attributed to the disease. Some of the patients complained of sticking sensations in the throat and tongue, but there was nothing that could be attributed exclusively to this affection, except the sensation of a foreign substance on the tongue.

The interest in this curious affection is more academic than otherwise, but, aside from this, because of its possible clinical significance and the uncertainty surrounding its etiology and pathology, I believe that cases of this comparatively rare disease are well worthy of record. I am indebted to Dr. Harmon Smith for the privilege of reporting the following case from his clinic in the Manhattan Eye, Ear and Throat Hospital:

Case 1. On January 4, 1912, a man, 45 years old, applied for treatment. He complained of more or less severe pains in the neck and back of the head; these pains were vaguely described and were not well localized. The patient appeared to be a very strong and robust man, said that he had always enjoyed the best of health, and that he had never had any serious illness in his life, but had had an occasional attack of tonsillitis. He denied specific infection. He is a moderate drinker and uses tobacco to excess. For some time (probably two months) he has experienced the sensation of having some foreign body on his tongue, but he did not come to the hospital on this account. He is continually trying to scrape this foreign substance off against the roof of his mouth, and with his teeth.

Examination of the tongue showed a dark brown spot, consid-

erably raised above the general level of the tongue, and having the appearance of wet hairs pointing towards the tip of the tongue. The spot covered an area about one inch long, and three-quarters of an inch wide, and extended forward from about one-half an inch in front of the circumvallate papillae, being symmetrically placed on either side of the median sulcus of the tongue. On lifting up the hairs with a probe, the spot assumed a tufted appearance, and it could be seen that only the tips of the hairs, which were about one-half inch long, were dark-colored, the bases being grayish. The remainder of the tongue showed nothing of particular interest.

A specimen removed with a sharp knife was submitted to Dr. L. W. Strong for examination, his report was as follows: Specimen consists of brownish-gray tissue, 1.5 cm. long by 3 mm. wide, through which run numerous dark lines, resembling hairs. The tissue consists of a felt-work of fibrils which are readily teased apart. There is no epithelium or submucous tissue present. Stained by Loeffler are seen numerous leptothrix filaments of varying length. These contain chromatin granules and have square ends. Many cocci are present.

On anaerobic culture, after 72°, the same beaded threads occur, also numerous fusiform bacilli and various streptococci and staphylococci; no spores. The fusiform bacillus grew aerobically after two sub-cultures. On wheat-bread gelatin, at room temperature, no moulds. The beaded leptothrix elements were present; no spores.

Culture.—Wheat-bread gelatin, after 480 hours, abundant growth of leptothrix at room temperature; no moulds.

The cultural and microscopical findings from these two cases do not support the view of Schmiegelow and of Sendziak that black tongue is due to *mucor niger*. They are consistent with the conclusions of Blegvad, that no specific parasite has been demonstrated for hairy black tongue. They furthermore give support to Blegvad's view that there is no hyperkeratosis. They show the presence of the fusiform bacilli commonly present in ulcerative conditions of the mouth. The pathological picture is practically the same in both cases.

The subsequent history of this case was most interesting. About ten days after he was first seen, the hairy spot was much smaller, the hairs having desquamated from the sides, leaving apparently normal mucous membrane. Five days later almost the entire spot

had disappeared, and over a much wider area and nearer the tip were seen numerous small black hairs; giving one the impression that the affection was beginning over again.

Case 2. The second patient is a young man, 39 years old, suffering of an intermittent discharge from the ear, following a radical mastoid operation performed eleven years ago. He was seen by me in consultation with Dr. Charles G. Brink, on January 14, 1912. The patient is highly neurotic and smokes cigarettes continuously. He denies specific history and his general physical condition is fair. He has a slight naso-pharyngeal catarrh and he has occasional attacks of neuralgia affecting the face and head. For several years he has had a sensation of some foreign substance being on the tongue, and has repeatedly tried to scrape it off.

Examination shows a patch raised above the general surface of the tongue, reaching from just anterior to the circumvallate papillae almost to the tip. This patch is about three-quarters of an inch wide and is in the center of the tongue. Near the tip it is almost black, and shades through brown to gray at its posterior limit. The appearance is that of fine wet hairs, closely packed together and pointing towards the tip of the tongue. On raising them up with a probe, they are seen to be closely matted together, and average about one-half inch in length, the longer hairs being posterior. Only the tips of the hairs are colored.

No change has occurred in the appearance of this case since it was first seen.

A specimen removed from this patient and submitted to Dr. Strong, gave practically the same pathological findings as the first case.

No treatment, yet employed, seems to have any effect on the duration of the disease, which seems to be self-limited. Applications of peroxid of hydrogen to the tongue, followed by an astringent solution will probably add to the comfort of the patient.

69 West Fiftieth Street.

NEGLECT OF THE TRACHEA.

BY JOHN A. THOMPSON, M. D., CINCINNATI.

Dr. Jackson's editorial in the February issue of *THE LARYNGOSCOPE*, calling attention to the way laryngologists have neglected diseases of the trachea is very timely. The severe acute conditions he describes are comparatively rare. Chronic inflammations in the trachea may be seen many times a day in the specialist's office if care is taken to look for them. Years ago the writer noticed that his cases of chronic laryngitis would do well for a time with careful attention to the nose and larynx. But sooner or later acute exacerbations would occur and the patient would lose all that had been gained in the relief of his cough and improvement of the voice. Such an occurrence was very apt to convince the patient that "catarrh cannot be cured" and he would cease his office visits and often decline to pay for treatments already given. Looking for the cause of such recurrences, I found they were usually an extension of an acute inflammation from the trachea. The predisposing cause of the acute inflammations in the trachea was a chronic inflammation of the tracheal mucosa which was not reached by any of our older methods of treatment.

In 1893 I began using tracheal injections to reach the inflammation below the region touched by laryngeal applications. To adjust the remedies to the conditions present has required careful observations of the tracheal mucosa in all cases where it could be seen by the indirect and in later years by the direct method. If especial attention is given to this examination and your technic is varied to suit individual conditions, only a few cases will be found where the tracheal mucosa cannot be clearly seen.

The results of years of study can be briefly summarized: All patients with old, obstructive lesions in the nose have chronic laryngitis, tracheitis and usually bronchitis. All patients with atrophic rhinitis have chronic tracheitis and bronchitis. The larynx is usually involved but sometimes escapes.

In all cases of acute rhinitis and bronchitis the tracheal mucosa is acutely inflamed and often remains so after internal remedies have apparently cured the bronchitis in the smaller tubes. The sounds heard on auscultation will indicate complete restoration of the lower bronchi while the laryngoscope shows acute congestion in the trachea. A possible explanation is that all the infected mucus

from the lower tubes must pass through the trachea, reinfecting that region.

In acute infectious influenza or "la grippe," bleeding-patches may often be seen in the trachea. The hemorrhage is not indicative of tuberculosis and the patient makes a complete recovery.

In other cases of influenza spots of intense congestion may be seen, although there is no bleeding. These congested spots remain in the trachea after the general inflammation has subsided. They cause an annoying cough that cannot be controlled or cured by internal remedies. The patient complains of a sore point in the neck or chest. In other cases the pain is referred to the region of the diaphragm. Give these latter cases a tracheal injection and they will say "that reached the spot."

Every asthmatic patient I have ever examined had chronic inflammation of the trachea and larger bronchi. Acute paroxysms of dyspnea are usually secondary to acute exacerbations of this chronic inflammation.

All cases of chronic bronchitis have also a chronic tracheitis. The mucosa of the trachea and bronchi responds to intelligent local treatment just as readily as the mucosa of the nose or pharynx does. These patients get little relief from internal medication. The treatment of chronic bronchitis and asthma should be part of the laryngologist's work. Selected remedies, given in oily solutions by tracheal injection, give better results than any other method of treatment yet devised.

Occasionally in chronic laryngitis we see recurrences of the local inflammation without a corresponding increase in the severity of the tracheal inflammation. Here the laryngitis is due to gastric hyperacidity with fermentation.

The eructations of very acid fluid (water brash) irritate the larynx and set up acute attacks. This is a sequence I have proved by examinations of the larynx and chemical tests of the stomach contents. No modern text-book mentions it.

In acute infections of the upper air-passages, if tracheal injections be given early and combined with constitutional abortive treatment the inflammation may be prevented from extending beyond the nose.

The laryngologist who does not carefully examine and treat the trachea, is neglecting a region frequently diseased. The extension of inflammation or infection from it may defeat his best efforts to cure disease in neighboring organs.

628 Elm Street.

ADDUCTOR PARALYSIS OF THE LEFT VOCAL CORD DUE TO MEDIASTINAL TUMOR, WITH SKIAGRAPH.*

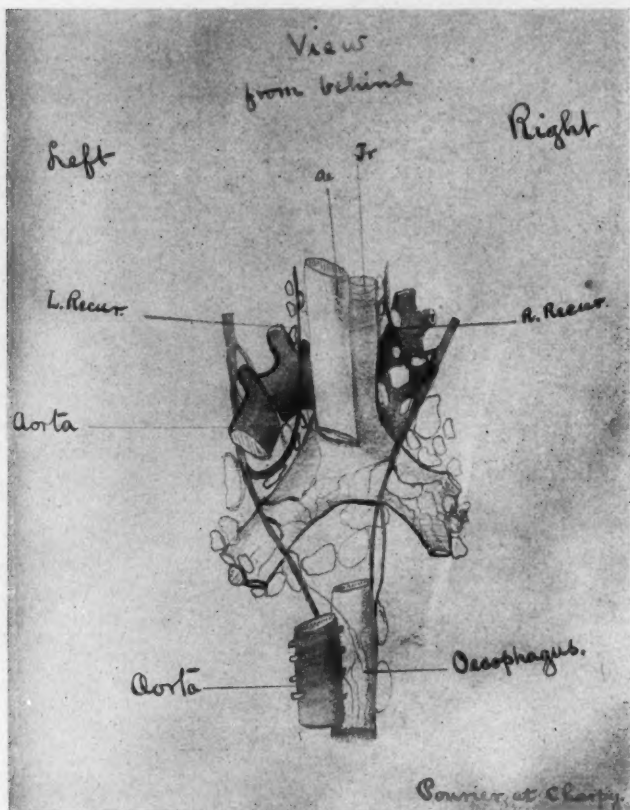
BY CORNELIUS DOREMUS VAN WAGENEN, M. D., NEW YORK CITY.

Ida G., 17 years, Russian; family history is negative. Three years ago, while resident in her home country, she became rather suddenly hoarse. She thinks this was owing to a severe cold, because she recalls a sore throat at that time, which, however, soon disappeared. About this time, she is uncertain whether before or after this severe cold, she submitted herself to adenectomy, but the faucial tonsils were not included in the operative treatment. Neither sores or patches in mouth or throat, nor skin eruption of any kind or location were noted by her, nor has anything of a similar appearance been subsequently observed by her nor by her family. She has never had any headache, though of late there has been a tendency to dizziness. She has never had rheumatism. She has had no spontaneous pains anywhere in the body but does complain of a transitory pain between the shoulders, after washing or similar work. She has had no edema or orthopnea. In fact she has been singularly free from any kind of sickness. There is now an occasional cough but no expectoration. The patient attached no importance to this long-standing hoarseness until the advice of solicitous friends determined her presence at the Vanderbilt Clinic.

The immature features of the mouth-breather are present, disguised by the fully rounded cheeks of a well-nourished but undersized person. The naso-pharynx is clear but a resident lacunar tonsillitis is present between the faucial pillars. The larynx, as a whole, is smaller than usual at her age, the epiglottis very much so, and laterally contracted, and there is a slight involution of the left ventricular band. The left cord at once attracts attention. During quiet respiration it remains stationary, midway between abduction and adduction. On phonating "e," however, there is a weak abductatory movement but absolutely no response from its opponent adduction. A compensatory hyper-adduction of the right cord has been established, but the approximation is not accurate and complete, with a consequent husky-to-hoarse voice. There is no interarytenoid thickening nor any other mechanical or pathological limitation to motion. Inspection and palpation of the neck, from

*Read at the meeting of the Section on Laryngology of the New York Academy of Medicine, February 28, 1912.

above downward, brings out absolutely nothing abnormal to the clavicular limit. Physical examinations of the chest, conducted from time to time by Dr. Theodore C. Janeway, Dr. William W. Herrick and Dr. Archibald McL. Strong, have added nothing to the original findings, which are as follows: Pupils, equal and of equal reaction.



No inequality between the right and left radial pulses. Skin, moderately pigmented. Heart, the apex beat is $4\frac{1}{2}$ inches to the left of the sternum and in the first interspace, but no cause can be found for this position. The first sound is impure and the pulmonic second sound is accentuated. Lungs: the slight difference in the percussion note between the two sides is insignificant. The breathing

is slow and noisier on the left than on the right side. The abdomen is negative. Dr. Howard Fox has reported the Wassermann reaction as negative.

Some kind of intra-thoracic pressure being suspected, Dr. Edward Leaming, Roentgenologist to Roosevelt Hospital, was requested to make these skiagraphs which are herewith submitted for your interpretation, as is also a view of the lymphatics, taken from behind, from Poirier et Charpy, "*Traité d'anatomie humaine*," Paris, 1902. These skiagraphs more or less distinctly show a large mass, believed to be a calcified node or nodes, in just about the proper position to the left of the sternum, to exert pressure on the recur-



Low position of the sterno-clavicular articulations caused by the downward inclination of the ray from the perpendicular.

rent laryngeal nerve. This nerve, with its companion, supplies all of the intrinsic muscles of the larynx except the crico-thyroidei, or external tensors of the vocal cords (superior laryngeal nerve).

Simple adductor paralysis of one cord is practically unrecognized but its association with a paralysis of abduction, as a sequence to traumatism or pressure, has been frequently encountered. Risien Russell (*Proceed. Roy. Soc.*, Vol. 51, p. 102), demonstrated, by dissection, that this nerve-trunk was composed of two distinct bundles of fibers, and, by electrical stimulation, that each bundle gave a separate and opposing motor impulse; the outer bundle with adduction the inner with abduction. He showed that when these abduc-

tor and adductor bundles were exposed to the air, under exactly the same circumstances, the abductors lost their power for the electrical conduction of impulses much earlier than the adductors. He proved that one bundle could be divided without injury to the function of the other bundle. He also brought out the fact that while the abductor influence was stronger than the adductor in the young dog, exactly the opposite was true in the adult animal. These investigations were stimulated by the assertions of Semon that, clinically speaking, abductor paralysis always antedated adductor.

Russell gave a very reasonable explanation for this difference of behavior of the phenomena, as developed in the young and adult dog. Respiration, he said, was fully developed from the beginning; consequently the nerve and muscle-fibers were in an equally high responsive state (abduction). Phonation, on the other hand, was but imperfectly developed at the start (adduction) with a corresponding weakness in nerve and muscle-fiber. When, later, phonation has reached its full development, respiration has become so automatic as to require but weak stimuli to keep it going. Applying these experimental truths to the case in hand and remembering that there is actual though weak abductor activity in this left cord, when weight is given to the position of the mediastinal mass, it would appear that we are confronted with a long-standing, yet incomplete interruption to innervation, due to pressure from without inward, in the course of the left recurrent laryngeal nerve. There are absolutely no symptoms indicative of a central lesion, while an hysterical basis must perforce rest on a racial characteristic and the dubious history of a sudden onset. The globular outline of the heart, suggestive to Dr. Leaming of a mitral disturbance, the ideopathic position of the apex beat and the noisier left-sided breathing sounds are, of themselves, subjects for separate interpretation. Taken in conjunction with these skiagraphs, they certainly do not localize an aneurism, though they might be advanced as additional evidence for the pressure theory entertained in this case.

Treatment, confined, as yet, to strychnia and potassium iodid, has had nothing more than a slightly tonic effect. Russell's findings in the canine subject and the intra-laryngeal evidence in this human analogue, initiated at the formative age of the fourteenth year and persistent, progressively so, if you will, down to the present time, would lead one to infer such a far-reaching disarrangement in the sequence of development as to approach the dignity of a permanent arrest.

Remarkable as are the recorded instances of rejuvenation in other situations in the human body, the prognosis, nevertheless, seems unfavorable and will not be enhanced by the patient's rather low mentality and her indifference through long association with her malady. Aside from the hoarseness she feels perfectly well and it is doubtful whether she will or can continue under an observation and treatment which affords so little present encouragement for ultimate cure.

616 Madison Avenue.

Two Cases of Nasal Lupus Treated by Pure Para-monochlorophenol BIGHATON. *Rev. hebdomadaire de Laryngol. d'Otol. et de Rhinol.*, Feb. 3, 1912.

The author reports two cases which, while the patients have been apparently cured for only a few months, demonstrate the value of para-monochlorophenol in such cases.

A crystal of sufficient size is placed in contact with the affected part for two seconds, the nose being immediately afterwards irrigated to prevent the diffusion of the caustic solution.

SCHEPPEGRELL.

The Surgical Management of Nasal Accessory Sinus Disease. L. A. COFFIN, *Med. Rec.*, June 1, 1912, p. 1021.

The various types of the affection are cited and classified. The method of treatment depends upon the stage of the disease, on the structural deformity of the nose, and especially upon the condition of the membrane lining the sinus. Fulminating cases frequently demand prompt external operation. Two cases are cited in detail. The majority of acute cases tend to recover of themselves, but the establishment of free drainage hastens the cure. The author believes the Killian operation to be the one of choice, and if at times this method fails to cause a cessation of the trouble, it is due to the fact that the surgeon has failed to find some accessory cavity or offshoot.

The details of the after-treatment of the wound are carefully considered.

LEDERMAN.

DISEASES OF THE LABYRINTH WITH SPECIAL REFERENCE TO THE FISTULA SYMPTOM.*

BY FRANK R. SPENCER, M. D., BOULDER, COLORADO.

A brief review of the physiology of the semi-circular canals may not be out of place before considering diseases of the labyrinth, especially since it has been only a few years since this branch of otology has been well understood. While in Vienna last year, I had an opportunity to study the internal ear and to see cases illustrating the different forms of labyrinthitis. The cases mentioned later in this paper were seen there and not in private practice.

According to Ewald's law, "The movement of the endolymph from the smooth end toward the ampulla is the more effective movement in the external or horizontal semi-circular canal and produces nystagmus to the same side." Conversely stated, the movement of the endolymph from the ampulla toward the smooth end is the less effective movement and produces nystagmus to the opposite side. If we consider the superior or frontal semi-circular canal and the posterior or sagittal, the law must be reversed.

With Ewald's law in mind we have at least the four following methods of testing the reaction of the labyrinth: The turning test, the caloric test, the fistula test and the galvanic test. The turning test has the advantage of testing both ears at the same time while its disadvantage is that each ear cannot be tested separately. However, if one labyrinth is more irritable than the other, the more irritable one determines the direction of the nystagmus. In case one labyrinth has been destroyed by disease or by an operation we are able to test only the remaining internal ear by turning. With the caloric and galvanic we may test either ear separately or both together.

Bárány has demonstrated that turning either to the right or to the left ten times produces the best reaction.¹ If we turn a person with normal ears ten times to the right and stop, he should have, immediately after the turning, a horizontal nystagmus to the left for fifteen to thirty seconds—that is, the quick component should be directed to the left. Conversely, after turning to the left ten times and stopping there should be a horizontal nystagmus to the right for fifteen to thirty seconds if the head has been held upright. The superior canal may be tested in a similar manner if the patient inclines his head forward during the turning and the pos-

*Read at the joint meeting of the Western Section of the American Laryngological, Rhinological and Otological Society and the Colorado Oto-Laryngological Society, Denver, March 30, 1912.

terior if he inclines his head backward. The last two canals produce, of course, a rotatory nystagmus.

The caloric test may be made with hot or cold water if the drums are intact or if suppuration is present. If there is a perforation and an absence of pus, hot and cold compressed air may be used in order to avoid moisture. Syringing with cold water normally gives nystagmus to the opposite side and with hot water to the same side. Cold water is usually more agreeable to the patient and should be about 25° C. Hot water should be about 48° C.

The test for a fistula can be made by either compression or aspiration. A fistula is usually located in the bony portion of the horizontal or external auditory meatus, as this is the most exposed of all the semi-circular canals to middle-ear suppurations. However, it may be in the cochlea, vestibule or one of the other semi-circular canals. Ruttin states that forty out of fifty cases in which a fistula was demonstrated, compression of air in the external auditory meatus and middle-ear produced nystagmus to the same side and aspiration produced nystagmus to the opposite side. In other words, this is the typical reaction of the labyrinth to condensation and rarefaction of air in the middle-ear and is the rule. This shows that the endolymph is driven by compression from the smooth end toward the ampulla, which is the more effective movement for the horizontal semi-circular canal.

The three tests just given all act on the endolymph in the labyrinth while the galvanic test determines the reaction of the eighth nerve. If we place the cathode in the right meatus we should expect a nystagmus to the right, and if we place the anode in the right meatus we should expect nystagmus to the left if the auditory nerve is normal. The test does not depend upon an intact labyrinth, as it may be used soon after the labyrinth has been destroyed by either disease or an operation. We may begin the test with four milliamperes of the galvanic current, but as much as eight to fifteen may be required before the nerve responds. If the nerve has been destroyed or is atrophic it will, of course, not respond.

Three degrees of spontaneous nystagmus are recognized: 1. Spontaneous nystagmus when the patient looks in the direction of the quick component, but which is absent when the patient looks either straight ahead or in the direction of the slow component. 2. Spontaneous nystagmus is present when the patient looks straight ahead, but is increased by looking in the direction of the quick component. The nystagmus disappears, of course, upon looking in the direction of the slow component. 3. The third de-

gree is present in all positions of the eyes, but is greatest when the patient looks in the direction of the quick component and is least when the patient looks in the direction of the slow component. Sudden destruction of one labyrinth always produces third degree nystagmus with the quick component directed away from the diseased ear. The slow component is the peripheral one and comes from the labyrinth while the quick component is always central. For instance, if we syringe the ear of an unconscious patient we produce only the slow component, as the central or quick movement of the eyes is absent. The eyes move in the direction of the slow component and remain in that position as long as the syringing is continued. Inflammations and suppurations of one side produce a nystagmus to the opposite side for from three to fourteen days.

The finger test can be made after syringing the ear. After cold syringing the patient falls toward the syringed ear if asked to stand erect with the eyes closed and misses the finger of the physician by passing his finger to the left of the observer if the left ear was the one syringed.

Ruttin gives the following table or classification of the different forms of labyrinthitis: 1. Cases of circumscribed serous labyrinthitis give a history of labyrinthian symptoms during the attacks. There is usually horizontal and rotatory nystagmus to the opposite side, but the nystagmus may be directed to the same side. Hearing is present; the fistula symptom is present and the labyrinth reacts to the caloric tests. 2. Cases of diffuse serous labyrinthitis do not give any history of labyrinthian symptoms during the course of the middle-ear disease. Third degree nystagmus is present with the quick component directed toward the affected side usually, though it may be directed toward the same side in mild cases. Hearing is usually absent, but it may be present. The ear usually reacts to the caloric test, but there may be a total absence of any reaction to this test. The fistula symptom is usually absent, but is present in those cases in which the diffuse serous labyrinthitis was preceded by a circumscribed serous labyrinthitis. 3. Cases of acute purulent diffuse labyrinthitis do not give any history of labyrinthian symptoms during the attack of middle-ear disease. Third degree nystagmus is present with the quick component directed toward the opposite side. The hearing, the caloric reaction and the fistula symptom are all absent. 4. Cases of diffuse purulent labyrinthitis give a history of labyrinthian symptoms during the attack. Spontaneous nystagmus is often absent, but may be present. The hearing, the caloric reaction and the fistula symptom are all absent. The first two types of labyrinthitis demand only a

radical mastoid operation while the third and fourth types demand a radical operation and an operation upon the labyrinth too.

Case 1: Mr. A., aged 25, examined June 29, had a radical mastoid operation on the right side, May 27, with an uninterrupted recovery. For the past few days he has had a severe vertigo, and the fistula symptom was found to be present upon examination. Compression produced nystagmus to the same side and aspiration to the opposite side. Examination of the eyes shows a spontaneous nystagmus with the quick component directed to the right when the eyes are turned to the right. The nystagmus was made stronger by moving the head, which shows that he is not a malingerer. He shows a slight nystagmus to the right after syringing, but does not fall in the direction of the slow component to the left, as we would expect. This latter test was made ten minutes after the syringing, so that it is not as valuable as if made immediately after the syringing.

Examination of the patient's hearing shows the following:—The patient hears a conversational voice at one-half meter with the right ear; Weber's and Rinne's tests were negative; bone-conduction slightly shortened. The upper tone-limit was below normal and the lower tone-limit was elevated. Turning the patient to the left ten times produced nystagmus to the right which lasted thirty seconds. Turning to the right ten times produced nystagmus to the left for twenty-seven seconds. Syringing the right ear with cold water gave nystagmus to the left. Diagnosis:—Diffuse serous labyrinthitis following circumscribed serous labyrinthitis. As he has had a radical mastoid operation he does not need any operation, but he should be watched to see if a purulent labyrinthitis develops.

There are three types of serous labyrinthitis so far as the hearing is concerned: 1. Cases with good hearing. 2. Cases with poor hearing. 3. Intermediate types with only a moderate degree of hearing.

Case 2: Mr. B., aged 18, right ear normal. History of left ear is as follows: Eleven years ago he had a Stacke radical mastoid operation on the left side. After the operation the discharge ceased. One year ago the left ear began to discharge again, but he has not had any headache, vertigo, or vomiting. Examination of the left ear shows the following: Hears a conversational voice at one and one-half meters; Weber's and Rinne's tests negative. The lower tone-limit is elevated and the upper tone-limit is below normal. By Schwabach's test the bone-conduction is not shortened. Caloric reaction present. Polypi and granulations present in the

antrum. Turning to the right ten times produced nystagmus to the left for fifteen seconds; turning to the left ten times produced nystagmus to the right for thirty seconds. Upon testing for the fistula symptom the patient showed nystagmus to the same side with compression and to the opposite side upon aspiration. Diagnosis:—Circumscribed serous labyrinthitis of the left ear. A radical mastoid operation is indicated. The prognosis should be guarded, as there is some danger of a purulent labyrinthitis following the radical exenteration.

Case 3: Mr. C., aged 34, gives a history of chronic purulent otitis media of the right ear for the past seven years, which followed influenza. One year ago the left ear began to discharge. The patient complains of headache, vertigo, nausea, and vomiting recently. Examination of the left membrana tympani showed a dry perforation in the posterior superior quadrant leading into the antrum. Examination of the hearing showed the following:—Conversational voice heard at one-quarter meter with the right ear and at two meters with the left ear; by Weber's test the fork was heard better in the left ear; Rinné negative for both ears. The lower limit was slightly above normal and the upper limit was normal. Spontaneous nystagmus was absent. The fistula symptom was present in the left ear with nystagmus to the left by compression and to the right by aspiration. Turning to the right ten times gave nystagmus to the left for thirty seconds; turning to the left ten times gave nystagmus to the right for thirty-one seconds which was normal for both labyrinths. As the vertigo in this case came on only fourteen days ago and since his hearing is as good as before, he has only a fistula without any disease of the membranous labyrinth. Diagnosis:—Circumscribed serous labyrinthitis. In this case only a radical is indicated, although we may treat this patient for a while, as the fistula may close without an operation. If the patient is not treated he is almost sure to have a purulent labyrinthitis.

In conclusion, I wish to emphasize the importance of making the test for the fistula symptom, because it yields, when present, valuable information and because it is an easy test to make. If present in any case of chronic purulent otitis media we are almost certain to find a cholesteatoma in the middle-ear and the antrum as the etiologic factor in producing the erosion of the outer bony labyrinth.

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1. "Researches on the rhythmic nystagmus reflected from the vestibular apparatus of the ear and its accompanying symptoms." (*Monatsschrift fuer Ohrenheilkunde*, 1906.)

NEW LIGHT ON THE HYPOPHYSIS CEREBRI.

BY IRVING WILSON VOORHEES, M. D., NEW YORK CITY.

Of recent years a great deal of attention has been paid to the study of those organs supposed to possess an internal secretion, and of these, the hypophysis cerebri has of late received especial consideration. Dr. Frederick Tilney, of the Department of Anatomy of Columbia University, New York, has recently written a most interesting and exhaustive monograph on this subject. ("Contribution to the study of the hypophysis cerebri, with especial reference to its comparative histology." *Memoirs of the Wistar Institute of Anatomy and Biology*. Philadelphia, Pa., 1911).

Anatomically, this gland consists of three main parts:—an anterior lobe, which is derived through evagination of the mouth-cavity; a posterior lobe, derived from the mid-brain cavity; and a middle portion or stalk connecting the two.

No end of discussion has taken place relative to the possible function of the pituitary body. The difficulty of determining such a question is here very manifest, although one has studied the gland histologically, experimentally and morphologically. It would seem that the opinions of investigators are divided about equally between those who believe that the hypophysis has no function and is simply rudimentary, and those who consider that its function is important but still unknown.

Sir Victor Horsley is credited with the first experimental work on the hypophysis. He removed this organ from two dogs, which lived respectively five and six months without symptoms. He then stimulated the brain-cortex, and found that a Faradic current of moderate strength produced marked tetanus, followed by severe epilepsy with clonic spasms fully as strong as those seen in traumatic epilepsy in man.

It seems that death is the ultimate outcome of the removal of the hypophysis. Cushing is convinced that total removal leads to a definite train of symptoms. He thinks that the anterior lobe is the most essential to life. His experiments showed that after removal of the anterior lobe, adiposity is a pronounced symptom, and that this is accompanied by a secondary hypoplasia of the genitals in adults, or by a persistence of secondary infantilism, if removal antedates adolescence. It is questionable how much of the symptom-complex following removal is due to removal itself, or how much to serious trauma.

Cyon found that both electrical and mechanical stimulation produce changes in the heart-beat and blood-pressure. He believes that the hypophysis, because of its connection with the third ventricle and its uncommon wealth of blood-vessels, is especially fitted to be influenced by fluctuations of blood-pressure within the skull-cavity.

The relation of the thyroid to the hypophysis is uncertain, but it is scarcely likely that one is the counterpart of the other, since all animals die after complete removal of the hypophysis even though the thyroid be retained.

Tilney concludes from his study of the development of the hypophysis that the posterior portion is practically quiescent, while the anterior portion contributes to the abnormal growth of the gland. This bears out the findings of Hirsch, of Vienna, who says that in adults upon whom he operated for hypophysis tumor, the anterior lobe has been cystic in nearly every case. Tilney reports six hypophysectomies upon cats, the majority of which died shortly after operation. The causes of death were septic pneumonia, basilar meningitis, purulent meningitis, purulent infection of both internal ears, and injury to and subsequent infection of the pons.

It has been thought to be very well established that disease of the hypophysis is always associated with acromegaly. This is not always true either from the clinical or from the anatomical standpoint, for the following reasons: (1) Sixty reported cases of acromegaly showed only 61 per cent with enlargement of the hypophysis (Arnold); (2) changes in the hypophysis may occur in the course of acute or chronic diseases (Thom); (3) the pathology of acromegaly includes many other organs and systems besides the hypophysis and bones (Arnold); (4) changes in the bone and soft parts are secondary to certain respiratory and circulatory diseases (Marie); (5) tumors of the hypophysis frequently exist without any symptoms of acromegaly.

One may, however, conclude from the literature and from Tilney's investigations, that the hypophysis is probably functionally active, that the anterior lobe possesses certain bodies called acidophiles, the secretion from which pass into the blood-stream and influence the various organs of the body like other internal secretions; and finally that the posterior lobe shows the presence of so-called basophiles, the secretion from which passes into the cerebro-spinal fluid, possessing some unknown action upon the nervous system.

A NOTE ON THE USE OF ALCOHOL IN ACCESSORY SINUS DISEASE.*

BY STEPHEN H. LUTZ, M. D., BROOKLYN.

After more than a year's use of alcohol for washing out all of the accessory sinuses and having had some success with it, I deemed it advisable to present it as a regular method of treatment and advocate its use in all acute cases. In many chronic cases I have obtained better results from its use than from anything else. The strength of the solution used is from fifty per cent to full strength, reaching the maximum after three or four treatments.

Taking a case of acute antrum as an example, my usual procedure is as follows: Perforate the naso-antral wall, wash the antrum with hot boracic acid or hot normal salt solution, blow the fluid out of the cavity with warmed air and then inject, by means of a syringe with a soft silver canula that can be bent and shaped to fit, a sufficient quantity of alcohol to fill the antrum to overflowing. The patient is instructed to hold the head toward the affected side and then bend forward to allow the overflow of alcohol to run out into a basin. The remainder is retained until the accumulation of mucus and serous discharge caused by the alcohol makes it necessary for the patient to free the nasal passages. The patient is instructed to blow the nose "wide open," no pressure being applied to either side of the nose.

With patience the alcohol can be retained for a period of ten or fifteen minutes before the wide-open blowing is allowed. The burning sensation lasts but a short time. Alcohol running down the throat or into the mouth sometimes causes cough or burning in the mouth. This is one of the chief objections made by the patient when the alcohol is used stronger than fifty per cent strength.

The results obtained in the following cases have convinced me of its value. In about fourteen months I have seen seventy-six patients with pus in the nose coming from the various sinuses as follows: Antrum, 28; antrum and frontal, 1; antrum and ethmoid, 19; antrum and sphenoid, 1; frontal, 3; frontal and ethmoid, 6; ethmoid, 9; frontal, ethmoid and antrum, 8; ethmoid, sphenoid and antrum, 5; sphenoid, 3; frontal, ethmoid, sphenoid and antrum, 2;

*Read at the meeting of the Eastern Section of the American Laryngological, Rhinological and Otological Society, Newark, N. J., January 20, 1912.

in all, 85 cases. The difference in figures is due to some patients having trouble on both sides of the nose.

These cases cleared up in the following manner: 2 in 1 week, 11 in 2 weeks, 15 in 3 weeks, 15 in 4 weeks, 13 in 5 weeks. Of the remaining 29 cases, 16 have recurrences at longer or shorter intervals and should have radical external or more extensive internal operations done, but they are comfortable a greater part of the time and they regard their recurrences as "colds" or they are satisfied with the condition now because they are better than they were before treatment. Seven of this group of 85 had radical work done under ether, the others were all operated under cocain anesthesia either in my office or at a hospital. A radical operation through the anterior wall was done in four cases of antrum disease under cocain alone, and in all of the 85 cases there was some operative work done under cocain and in every case pus was washed out of the cavity opened.

In old antrum cases where there is thickening and polypoid degeneration of the mucous membrane, alcohol reduces the thickening in a very short time, thereby making it possible to do less curetting than was formerly thought necessary.

Any of the accepted methods of attacking accessory sinus disease intra-nasally may be used to procure a free opening for drainage. When alcohol is used for washing the drainage must be free and unobstructed. All polypi that can be reached must be thoroughly removed.

I do not offer this as a cure all. Where there is necrotic bone that cannot be reached from within the nose, in the frontal, ethmoid or antrum regions, the external route must be resorted to. No amount of intra-nasal treatment will cure this class of cases.

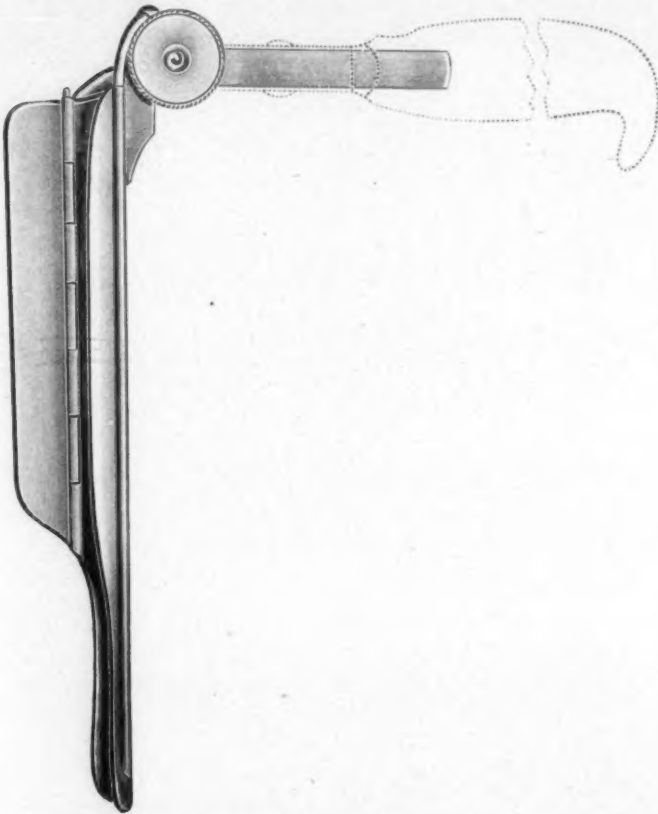
I do not think alcohol has been generally used as a means of treatment and that is my reason for presenting this paper for your consideration.

284 Hancock Street.

AN ADJUSTABLE OPEN SPECULUM.

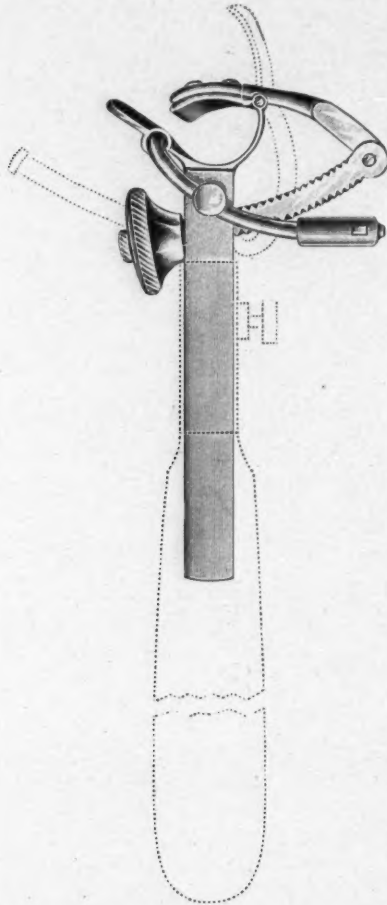
BY HARRIS P. MOSHER, M. D., BOSTON.

Where the open speculum will work, and it will work in two-thirds of the cases, I consider it the speculum of choice, especially in operative cases. By making this speculum in two parts after the



fashion of the bi-valve speculum, and by placing the hinge the full length of the closed side, and by controlling the opening of the two halves of the speculum by a lever which runs through the handle, the fixed open speculum is converted into one which is adjustable. How this is accomplished is shown by the cut.

The speculum as it is now made, therefore, can be adjusted to any width. It can be made an open or a closed speculum at the wish of the examiner. When it is only partially open it acts as its own tooth-plate. Only when it is open widely is it necessary to protect the teeth by a plate.



For short examinations or short operations, light reflected from a head-mirror gives a beautiful and satisfactory illumination of the field. As the eye soon tires, the speculum has been fitted with a light-carrier so that the operator can use at his pleasure either reflected or direct light.

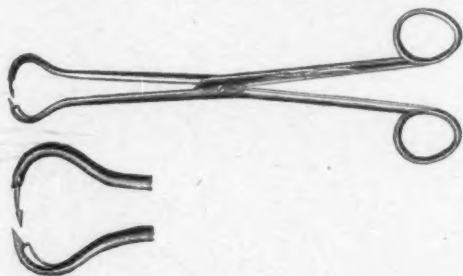
828 Beacon Street.

AUTOMATIC TONSIL SUTURER DEMONSTRATED AT DOCENT'S VEREIN, AUSTRIA.

BY L. J. DESWARTE, M. D., MILWAUKEE.

This instrument, as Figure 1 shows, is used to pass a suture through the tonsil automatically, this suture serving as an anchor to exert traction during tonsil operations; thus replacing the tonsil forceps.

The advantages of this suture are: (1) The suture is firm and cannot slip off as so frequently happens with a tonsil forceps. (2) We have one less instrument in the mouth to obscure our



view or obstruct our manipulations in an already small space. (3) Both tonsils may be armed with an anchor-suture before the operation on one side has by hemorrhage covered the field of operation on the other tonsil. (4) The patient can easily expectorate any fluids which may collect in the mouth, without removing our hold on the tonsil. (5) The construction and manipulation of the instrument is simple. (6) When operating under a general anesthesia we can easily turn the patient to one side to allow the fluids to flow from the mouth without having the forceps dangling from mouth. (7) A suture can easily be passed through the uvula and uvula. (8) The snare-loop can be passed over the suture with ease.

This suture can be advantageously used in cases of post-operative tonsillar hemorrhage and to suture the anterior and posterior pillars, using a friction-knot to tie the suture. Such a suture is much better than any Mikulicz clamp now made, because one can regulate exactly the amount of tissue to be included in the suture;

thus more readily avoiding necrosis. The removal of the suture is also very much easier than that of a clamp. The advantages of such a suture over the larger instruments which are kept in the mouth are self evident.

Finally I wish to call your attention to its use in uvula operations. The suture may be used as an anchor in uvula-operations of almost any nature, or the suture may be used to sew the flaps together after a \wedge has been excised.

204 Grand Avenue.

Ethmoidectomy for Epithelioma. AUDIBERT. *Rev. Heb. de Laryngol. d'Otol. et de Rhinol.*, February 24, 1912.

The patient, a man of 55 years, suffered from nasal obstruction and epistaxis, but no pain. The right nostril was filled with a granulating mass which entirely covered the middle and inferior turbinals, a histological examination showing it to be epithelioma. There was no glandular involvement.

The neoplasm as well as the middle and inferior turbinals were removed and the ethmoidal cells and adjoining parts thoroughly curetted. The operation was done by the external route, the superior maxilla the nasal bone and the nasal process of the frontal bone being resected. There was free hemorrhage which was controlled by tamponing.

At the time of the report, three months after the operation, there had been no indication of recurrence and there is little deformity.

SCHEPPEGRELL.

A NEW LOCK FOR THE NASAL WIRE SNARE.

BY JULIUS SZYMANSKI, M. D., CHICAGO.

The frequent annoyance occurring in the use of the many nasal snares has prompted me to design a snare, whose chief advantage is its great simplicity and strength. The instrument is constructed entirely of steel and by the use of an eccentric locking-device for holding the snare-wire, all screws, catches, etc., are done away with. The wire may be renewed with the greatest ease and in but a frac-



tion of the time required with other snares. The instrument is made by V. Mueller & Co., of Chicago.

This lock can be closed or opened with only one movement of the finger. The loop of the wire can be enlarged or diminished during the same operation. The snare is pulled out by means of forceps.

1053 Milwaukee Avenue.

Some Mastoid Experiences. C. M. MILLER. *Jour. of Ophthal. and Oto-Laryngol.*

A recital of several cases showing the different conditions that may arise necessitating a thorough understanding of the various pathological changes found in and about the temporal bone, and the necessity for early, complete and often extensive operative work.

STEIN.

SOCIETY PROCEEDINGS.
THE PHILADELPHIA LARYNGOLOGICAL SOCIETY.

Regular Meeting, April 30, 1912.

ROSS HALL SKILLERN, M. D., PRESIDENT.

SYMPOSIUM ON THE MAXILLARY SINUS.

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|-----------------------------------|----------------------|
| 1. Salient Points in the Anatomy. | DR. C. A. O'REILLY. |
| 2. Pathology and Diagnosis. | DR. G. W. MACKENZIE. |
| 3. From the Dental Standpoint. | DR. J. A. HUGGINS. |
| 4. Orbital Complications. | DR. WENDELL REBER. |
| 5. Intra-nasal Operations. | DR. R. H. SKILLERN. |
| 6. External Operations. | DR. G. M. COATES. |

Anatomy of the Maxillary Sinus. By CHARLES A. O'REILLY, M. D.

The maxillary sinuses are largest of the four important accessory sinuses of the nose. They are two large pyramidal cavities situated, one in each superior maxillary bone. The base is formed by those constituents which enter into the formation of the lateral nasal wall, viz.: maxillary process of inferior turbinate, portion of the palate bone, uncinate process, lamella of ethmoidal bulla, and the pars membranacea. The cavity is bounded above by the floor of the orbit, within by the outer wall of the nasal fossa, below by the alveolus, the floor being considerably below the normal outlet of the sinus, (also floor of the nose). The most important wall from the standpoint of the rhinologist is the nasal wall, for two reasons, first because it contains the sole opening into the sinus and is first to show pathological changes when the sinus is affected, and second, it is the thinnest and presents the easiest mode of attacking the cavity, either for diagnostic or therapeutic purposes.

Next to the nasal, the orbital wall is the thinnest of the boundary walls, particularly in that portion which is occupied by the infra-orbital canal. This canal is on the superior surface about half-way back, and ends in the infra-orbital foramen. It transmits the infra-orbital vessels and nerves. In many specimens it appears as a thick elevation of bone or a well-marked ridge in the roof of the sinus.

The floor of the normal sinus extends from the first bicuspid to the third molar. As the floor of the sinus does not run parallel with the alveolar process, but is strongly curved from below upward, it naturally follows that the roots of one or two teeth must come in closer proximity to the floor than those situated at the extremities of the sinus. These two teeth, as will be observed, are the second bicuspid and the first molar; therefore, to those attention must be first directed, not only for diagnostic but also for therapeutic purposes in empyema of the sinus.

In the posterior walls are the canals transmitting the posterior dental vessels and nerves to the teeth. The ostium maxillare is the largest

and most constant orifice of the antrum, and is situated at the posterior portion of the hiatus semilunaris. These cavities of course vary in size, both in races and individuals. They are sometimes crossed by thin laminae of bone, dividing them into two chambers. The glandular supply is very meager, being confined for the most part in the region of the ostium.

The mucous membrane receives the blood-supply from the branch of the nasal artery. The antral walls receive double supply. Both sides are covered with periosteum, through which they receive double nutrition.

The nasal orifices of the maxillary and frontal sinuses, as well as those of the anterior ethmoidal cells are in close proximity, and it has been shown that secretions from the frontal sinus may drain into the antrum and therefore give symptoms of antral empyema.

Pathology and Diagnosis of Maxillary Sinus Suppuration. By GEORGE W. MACKENZIE, M. D.

In order to comprehend the pathology and diagnosis of any disease we must know something of the anatomy—gross and microscopic—and the physiology of the structure involved.

The gross anatomy of the maxillary sinus has been ably presented by Dr. O'Reilly. Concerning the physiology, but little is definitely known. I have, therefore, to preface my paper with a brief outline of the microscopic anatomy of the mucous membrane lining the maxillary sinus.

The mucous membrane is normally thinner and more delicate of structure than that which lines the nasal chamber proper. It is composed of three essential layers:

1. Surface layer is composed of ciliated columnar epithelium with a basement membrane. The basement membrane is barely discernible under normal conditions.
2. Middle layer is composed mostly of very loose connective tissue, scattered through which are compound tubular glands, together with some simple short tubular glands. These glands are considerably less numerous than those found in the nasal mucous membrane. Also in this layer and close to the surface layer we find here and there small clumps of small round cells, lymphoid in character.
3. Deepest layer is composed of dense connective tissue which is difficult to separate or distinguish from the periosteum, the one blending imperceptibly into the other.

The normal mucous membrane, excepting at the ostium maxillare, is about as readily separated from the underlying bone as the dura mater.

Pathology: In the case of a mild irritation there results a simple congestion of the mucous membrane associated with slight swelling and redness. With a greater degree of irritation we find the congestion more pronounced and when continued for some time a true inflammation follows and with it there occurs an increase in the number of small round cells immediately under the epithelial layer. The congestion stimulates an increased activity of the surface epithelium so that we find the number of goblet cells greater than normal and, too, we find an increased functional activity of the glands. Somewhat later the character of the

secretion is altered; it becomes thicker, more opaque and of greater specific gravity, the sum of which equals the simplest form of acute catarrh.

Under the influence of a still greater irritation, for instance, that which is produced by the more virulent forms of microbic infection there results a most pronounced inflammation. The congestion and thickening of the mucous membrane is greatest, the round cell infiltration is most pronounced and reaches deeper into the middle layer. Inflammatory edema is pronounced and helps to add to the thickening of the mucous membrane. Besides hemorrhages may occur. Sero-fibrinous exudate is added to the already increased and altered secretion. Occlusion of the ostium from inflammatory edema about it, followed by retention and pressure causes a bulging of the membranous portion of the median wall. Continued occlusion with retention may, but rarely does cause necrosis of parts of the bony wall.

As a result of frequently repeated attacks of catarrhal inflammation we find secondary pathologic changes in the mucous membrane. Since catarrhal inflammation is a productive inflammation we naturally find a permanent thickening of the mucous membrane involving all of its elements; but especially the connective tissue. The mucous membrane is thicker and firmer than normal—hyperplastic.

The glandular elements are not increased in actual numbers but in their ramifications. The lymphoid elements are increased. The epithelial layer is thicker and metaplastic, and the basement membrane is thicker and takes the acid stains more readily than the normal. The contraction of the hyperplastic connective tissue occasionally shuts up a duct of a gland causing, thereby, a cyst-formation. Other pathologic changes including hydrops antri may occur but the short time allowed prevents me from taking them up in this paper.

As a result of long-continued irritation of pronounced intensity, in other words, that which produces the destructive forms of inflammation (suppuration) we have marked metaplasia of the epithellum, where it is intact, which may later be the source of carcinomatous development. Furthermore we may have polyp formation, osteophytic thickening of the bony walls.

Besides the above-mentioned typical inflammatory conditions of the maxillary sinus, the sinus may be involved with other less frequent infections, including the granulomatous infiltrations of tuberculosis and syphilis. Furthermore we may have it involved with ozena which I am inclined, at present, to believe is due to a secondary infection from the nose rather than to a primary infection of the sinus. We may also find the maxillary sinus containing pus which has found its way into the cavity by gravitation from one of the other anterior set of sinuses through the hiatus semilunaris, while at the same time the maxillary sinus itself is but slightly disturbed. Though not doubting it I have never met the condition in my experience.

Furthermore the sinus may be involved, secondarily, from the extension of inflammatory processes on the outer surface of its bony walls, notably in cases of abscess in and about the roots of the teeth, inversion of teeth and infection of dentigerous cysts.

Diagnosis: The diagnosis of maxillary sinus suppuration is suggested by the symptoms and signs of the disease and verified by the actual finding of pus in the cavity. The symptoms and signs usually present are:

1. Fever, due to the original infection or as more frequently happens from the absorption of the toxic elements of the secretion in the sinus itself, when the sinus disease develops late, after the acute infection in the nose has had time to subside.

2. Pain, although variable in intensity is usually deep-seated. We may find, besides, in these cases, where the infra-orbital nerve is particularly exposed in the roof of the sinus an intense neuralgic pain radiating to the malar, orbital and temporal regions and occasionally to tip of nose, associated with lacrimation on the corresponding side and superficial numbness, and tingling sensation. Pain is characteristically worse in the morning hours and better some hours after getting up, because of the filling and emptying of the cavity of pus.

3. Swelling and redness of the external walls with slight thickening of the periosteum through extension of the inflammatory process by way of venous and lymph channels from the muco-periosteum lining the interior of the cavity, much the same as we find on the external surface of the mastoid process in cases of acute empyema of the mastoid cells.

4. Tenderness, deep-seated over the sinus, the outline of which depends upon the anatomical characteristics of the sinus which varies materially in individual cases. This tenderness is easily ascertained by percussion with the end of the finger. The degree of tenderness depends upon the degree of inflammation of the muco-periosteum and not upon the extent of the secretion.

5. Unilateral muco-purulent discharge occasionally mixed with blood is a characteristic symptom when present but its absence means nothing, for we may have a closed empyema. The discharge when present in quantity may drop from the nose when the patient leans forward. It must not be forgotten that in cases of syphilis and foreign bodies we may also have a unilateral discharge. On close inspection after shrinking the mucous membrane of the affected side, the discharge may be traced to its source from the middle meatus, i. e., between the lateral surface of the middle turbinate and lateral nasal wall.

6. Subjective sensation of an offensive odor in the nose but not noticeable objectively. The symptom although not present in all cases is quite suggestive of sinusitis when it is.

7. Inflammatory edema of the mucous membrane of the middle meatus, indicated by red and acute swelling of the lateral aspect of the middle turbinate and the corresponding portion of the lateral wall of the nose, which contracts less readily than normal mucous membrane under the influence of cocaine or cocaine-adrenalin applications.

8. Transillumination of a pus-filled antrum should show a shadow on the affected side, but since the cavity is often empty at the time of our examination it may be quite misleading.

9. The demonstration of the presence of pus in the cavity by puncture lavage has proved to be the one most certain sign of empyema of the maxillary sinus and no positive diagnosis should be made without it;

furthermore, since this method of diagnosis forms one of the simplest methods of treating empyema it may be recommended in practically all suspected cases. It is barely possible that you may get a negative puncture, in spite of a positive empyema, in those cases where the cavity has recently been drained through its natural or accessory openings.

One caution suggested by Hajek I wish to endorse and that is that a negative finding proves nothing, but a positive one does. So that all cases with negative findings require a second or third examination before coming to a positive conclusion.

The time-limit prevents me from taking up the subject of differential diagnosis.

From the Dental Standpoint. By JOSEPH HUGGINS, D. D. S.; (by invitation).

I am greatly pleased at the opportunity to participate in this very important symposium. As you are all well aware, this subject is of very particular interest to the dentist on account of the close proximity of certain teeth to the maxillary sinus. The relative position of these teeth to the antrum will naturally depend on the size and shape of the latter.

We are all aware of the remarkable anatomical variations of this cavity in different persons, likewise in the individual they may also develop unequally, but normally they are about equal. I may say, therefore, from the dental standpoint, there is no fixed rule to guide one in the diagnosis and treatment of all cases. The teeth that are suspected of being the cause of antrum disturbances, are, occasionally the cuspid, usually first and second bicuspid and first molars. Many times these teeth have been needlessly sacrificed, making that side of the patient's mouth unfit for mastication.

Quoting from the "Internal Textbook of Surgery," volume 2, page 93 "The antrum of Highmore, or maxillary sinus, is the sinus most exposed to injury and the most frequently subjected to inflammation. It is situated on a lower level than the frontal and ethmoid sinuses and its opening is so situated with reference to their outlet that the products of inflammation in them may flow into this sinus which then may serve as a pus reservoir. The opening is also so situated in the middle meatus that it is liable to be occluded by a swollen turbinated body."

Therefore, because a tooth is abscessed, or perhaps has a putrescent pulp, is no reason why it should be held responsible for an unhealthy condition of the maxillary sinus when such exists. On the contrary, we must consider the diseased sinus as the likely cause of the tooth trouble. The blood and nerve supply of the teeth is in close relation to the floor of the antrum; if the lining membrane of the latter becomes diseased and perhaps its floor necrosed, the teeth may become devitalized and finally an abscess may result. Because I believe with Dr. Cryer that in most instances carious teeth are not the direct cause of maxillary sinusitis, I invariably consult with a rhinologist in all suspected cases of antrum involvement.

In conclusion, I wish to say that, caries of the teeth is not the direct cause of maxillary sinusitis, but may become the predisposing cause. For example: a tooth with a vital nerve may have a cavity and with proper pro-

tection to that nerve the cavity can be filled and decay completely arrested; on the other hand, if the caries is allowed to continue and the nerve becomes exposed the result would be the death of the nerve, and if not properly treated an avenue might be established through which the sinus could become infected.

Orbital Complication. By WENDELL REBER, M. D.; (by invitation).

When we consider that the eye is surrounded on all but its temporal side by the accessory sinuses, it is an interesting fact that orbital complications do not arise more frequently.

The floor of the orbit is held to be thicker than the inner and upper walls. This explanation has been advanced by some to account for the more frequent invasion of the orbit by way of the ethmoidal and frontal sinuses than by the maxillary sinus. Birch-Hirschfeld, however, places the maxillary sinus as second in the frequency with which orbital complications are produced. The great point of contention at present in all these cases is the path taken by the infection. It may be by direct extension, in which case there will most likely result orbital cellulitis, which in turn may affect the blood-vessels and thus eventually reach the cavernous sinus, with almost invariable fatal result. Infection may also follow the venous passages and this is probably the most frequent channel. This is not surprising, however, when we recall the anastomosis of the superior and inferior ophthalmic veins, the facial and palatine veins, and the orbital and pterygoid plexus.

The signs of beginning orbital cellulitis in connection with maxillary infection are usually first seen within the orbital cavity. Edema of the lids, followed by protrusion of the eye-ball, restriction of the movement of the eye-ball, especially downwards, pain in the fifth nerve, sensitiveness of the optic nerve and sensitiveness to light, are the main signs and symptoms.

The usual method of estimating the protrusion of the eye-ball is by considering the profile on both sides. This is very inaccurate, and recently Hertel of Jena has perfected an instrument—the exophthalmometer for the purpose of taking such measurements. It consists of a graduated scale in millimeters, carrying two narrow mirrors set at right angles. There are two angular recesses which are placed against the external orbital walls, the graduated scale extending towards the operator, when by means of the reflection of the eye-balls in the mirrors the protrusion is easily read off in millimeters.

Diagnosis of incipient orbital cellulitis is not easy. I recall one such case associated with maxillary sinusitis—that of a child, 4 years old. I can also recall another case which came to me a number of years ago for refraction. Two years later the patient returned complaining of discomfort in the left eye. I could find no cause for the trouble as there was no change in his ocular conditions; he was therefore referred to a rhinologist. After examination he gave me a negative report but I requested a re-examination and after three or four sittings he reported the discovery of a small drop of colloid material from the middle nasal passage on

the affected side. The antrum was emptied and treated, when the ocular trouble subsided speedily, and the patient returned to the use of, and is still using the lenses originally prescribed.

There are a few other intra-ocular conditions resulting from maxillary sinusitis. There may be thrombosis of the central retinal vessels but this is very difficult to determine; there is no denying, however, that it may often be due to intra-nasal disease. There are three almost right-angle bends in the central vessels, that enter the eye, and it is hardly likely that an embolus could pass all three; it is much more likely that a thrombosis might occur in the venous plexus. (Dr. Reber then showed a series of fine lantern slides demonstrating the blood supply, etc.)

These veins are without valves, and the amount and direction of the venous flow of the blood within the orbit depends upon the position of the head—as, standing erect, head bent forward or in lying down.

Another source of infection may be through the lymph channels, which according to Birch-Hirschfeld traverse the orbital tissues, and doubtless infection may travel through these. (Also shown by lantern slides.)

Intra-nasal Operations on the Maxillary Sinus. By ROSS HALL SKILLERN, M. D.

The kind of intra-nasal operation to be employed in maxillary sinus empyema depends very largely upon the condition which confronts us. If it is an ordinary case of short standing in which only conservative treatment had been tried (keeping patulous the drainage passage) and where there is no suspicion of dental involvement, it is wise to begin with ordinary needle puncture and irrigation.

Technic of needle puncture: How long shall we continue this treatment before attempting a greater procedure? It depends entirely upon what influence the irrigation has upon the consistency and amount of the secretion. If it becomes noticeably of less quantity and perhaps loses some of its fetid odor or if the consistency begins to change from a cheesy, crumbly character to a gelatinous mass, we can safely continue the daily irrigations until a cure results, even though it requires several months. The daily treatments can be gradually reduced to thrice weekly and later semi-weekly as long as the secretion does not augment itself.

Suppose, however, our needle punctures have no apparent influence upon the course of the disease. There is no other way than to make a large and as far as possible permanent opening from the nose into the maxillary sinus. Numberless operators have devised methods for this purpose through both the inferior and middle nasal passages. Some of these procedures are simple, some complicated. I shall only mention several in most common usage and two in detail which I consider as the best adapted for the purpose.

Creating a large opening beneath the inferior turbinate: This is accomplished with a trocar such as Wilhelmski's which catches the fragments of bone as the instrument is withdrawn; thus making the opening larger. These spicules are removed with the forceps and the operation is completed. Creating a large opening in the middle nasal fossa is a procedure recommended by Onodi but finds little favor in this country.

Other modifications of these seem to be almost without number but for all practical purposes Dahmer's method, or still better the pre-turbinal method, seems to meet with all requirements when an intra-nasal operation will succeed.

Dahmer's method: Saturate a wisp of cotton with twenty per cent solution of cocaine and apply to lateral nasal wall, above and below the anterior end of the inferior turbinate. After ten minutes introduce scissors and sever the anterior attachment close to the wall. It is not necessary to remove more than one-half inch of turbinate tissue. The Krause snare is applied over the cut, pendulous portion which is removed by gradually contracting the loop. In this manner hemorrhage is prevented. The mucosa of the lateral wall beneath the excised portion of the turbinate is cut on three sides, the base representing the floor of the nose. This flap of mucosa is resected and turned back against the septum leaving the denuded bone in situ. A Wilhelmski trocar is forced through at this point and on withdrawal makes the opening as large as possible.

The anterior portion is removed with Wagner's curved biting forceps until the hole is slightly larger than the size of the flap. Any spicules remaining along the posterior portion can be removed with straight forceps. After smoothing the partition between the nose and the sinus the flap of mucous membrane is turned into the antrum; thus completing the operation. The flap is held in position by strips of iodoform gauze. After-treatment consists in removing the top layers of gauze but not the lowest which holds the flap in place until the fifth day.

An operation which far surpasses any procedure beneath the inferior turbinate for operating on the antrum is one that we will designate "the pre-turbinal method." In this the sinus is reached through the front instead of the side.

Technic: Anestheization must be complete; therefore, it will be necessary to make sub-periosteal injections of Schleich's solution in conjunction with the application of a strong cocaine solution to the mucosa. After superficial cocaineization, injections are made in front of and below the anterior attachment of the inferior turbinate. An incision is then made beginning above and in front of the inferior turbinate and extending well down into the floor of the nose. This should include all tissues to the bone.

With a sharp elevator the soft parts are elevated from both the nasal and facial aspect of the crista pyriformis until it is free for at least three-quarters of an inch on either side. A hollow bayonet chisel is used first above, then below, until the maxillary sinus is pierced. Care must be taken not to allow the fragment of bone to become lost in the sinus. The opening is enlarged with the chisels or electric drill until sufficient room is obtained to thoroughly inspect all parts of the cavity, especially the floor and nasal wall. It is now a simple matter to curette all portions of the mucosa which appeared diseased and introduce sealed iodoform gauze for purposes of drainage. After-treatment consists in irrigation and insufflation of iodoform or any suitable powder. Cure takes place as rapidly as with the Caldwell-Luc.

This operation has the following advantages: 1. The interior of the sinus can always be inspected. 2. Local applications can be made to diseased areas resisting treatment. 3. The inferior turbinate is preserved in its entirety.

Extra-nasal Surgery of the Maxillary Sinus. By GEORGE M. COATES, M. D.

External operations, which are dealt with in this paper, are in contradistinction to the methods of operating on the maxillary sinus—intra-nasal operations—which have been treated by the previous essayist. Extra-nasal operation is the more proper term, since in this class, the entrance to the antrum is made from the mouth and not through the skin of the face as it would be in a distinctly external operation. This latter procedure is practically never resorted to except in case of malignant growths which will not be considered in this paper.

As a rule the surgeon does not have recourse to the radical procedure of an extra-nasal operation, either in acute or chronic suppurations of the sinus, until the more simple intra-nasal methods have been tried and failed. If needle, puncture and irrigation, or a more complete intra-nasal opening has not cured the disease within a reasonable time the radical operations may still be resorted to with great chance of success. The causes for failure in this, the intra-nasal type of operation, are great pathological changes in the lining mucosa, consisting of edema, thickening or polypoid degeneration, caries or necrosis of the bony walls, carious roots of teeth projecting into the cavity, and partial or complete septa in the sinus.

When the character of the disease is such that simple drainage will effect a cure the intra-nasal type is the operation of choice; but when the obstacles to a cure which have been enumerated are present it is necessary to secure greater space for inspection and removal of them; hence the route chosen through the canine fossa. It is rarely necessary to operate in this manner in acute cases of empyema; in fact only when caries of the anterior wall can be demonstrated, or is strongly suspected. In chronic cases, however, where the surgeon feels that the progress of the disease has been such that the chance of a cure by an intra-nasal operation is small or in certain cases for the removal of foreign bodies which may be the cause of the antral disease, much time may be saved by immediate recourse to the radical operation.

In the great majority of cases a complete cure can be obtained by either the Caldwell-Luc or the Denker operation in a space of time varying from three or four weeks to as many months depending upon the thoroughness of the operation and the amount of pathological changes that have taken place. According to the statistics of different operators the percentage of complete cures varies from eighty-five to ninety-five.

To reach a successful issue two things are absolutely necessary, namely: to remove every vestige of necrotic bone and all mucosa too badly diseased to regenerate; and secondly, to establish a large and permanent connection with the inferior meatus of the nose for the purpose of drainage and subsequent treatments. If the operation fails to cure it will be because the operator has failed for some reason or other in one or both of these essentials.

Desault, writing in 1798, first advocated opening the antrum through the canine fossa and it is from this pioneer operation that those in vogue at the present time have sprung. More than ninety years after Desault, Kuester revived his method and in turn there were further modifications by Caldwell, in 1893, by Jansen, in 1894, by Luc, Boeninghaus, and Lothrop, in 1897, and by Denker, in 1910, which last is the most radical procedure up to the present time. For a long time the Cooper operation was held in high regard by many and at the present day still has advocates and is frequently practiced by dentists. By the Cooper method an entrance is obtained to the sinus through the alveolar process, a carious tooth, usually the second bicuspid or the first molar, being extracted and the socket enlarged by hand drill or engine-driven burr until the cavity of the sinus is reached. Through this opening the sinus can be irrigated, but neither curetted nor inspected. Another cause of failure is the tendency of the opening to close in spite of ingenious hard rubber or gold tubes made to retain its patency until the cure is established. Add to this the discomfort to the patient of having long-continued drainage of fetid pus from his antrum into his mouth and we can safely condemn this method as unsatisfactory. An additional disadvantage lies in the occasional loss of cotton from the tip of the applicator when introduced through the narrow opening, which, of course, necessitates a radical procedure for its removal as the retained foreign body will very effectually prolong the suppuration indefinitely. In many cases also the opening through the alveolus remains permanently, after the sinus suppuration has ceased and is then a constant source of re-infection.

The same objection in a lesser degree applies to the Kuester method where part of the anterior wall of the sinus is removed and the cavity packed with iodoform gauze and drained through the mouth until the cure is obtained. The two operations of choice if a radical procedure is desired, are, therefore, the Caldwell-Luc and the Denker, the technic of both of which are well established.

The Caldwell-Luc operation: This operation may be done under either general or local anesthesia. If a general anesthetic is preferred, as is usually the case, ether is the safest to use and should be administered by the Ruppert apparatus or one of its modifications. By this method the warm ether vapor is forced by a pump through the bent tube hooked in the corner of the patient's mouth on the side away from the operating surgeon. This insures complete and satisfactory anesthetization of the patient at all times, avoids use of gauze or ether cones and consequent interference with the surgeon, and allows the anesthetist to take a position where he will be out of the way and yet be able to keep his patient under satisfactory observation.

The patient's head should be turned towards the unaffected side. An incision is now made through the mucous membrane and periosteum at the labio-gingival junction from above the canine tooth to the second bicuspid. After thoroughly elevating the periosteum with a sharp periosteal elevator a small opening is made in the anterior wall of the sinus through the canine fossa. This opening is rapidly enlarged with rongeur bone forceps until most of the anterior wall of the sinus has been re-

moved. The cavity of the antrum thoroughly mopped out with gauze sponges, all secretions and blood being removed. With a sharp curette all badly diseased mucous membrane is now thoroughly removed, all carious areas scraped until sound bone is reached and all septa broken down completely.

It is now necessary to make the opening into the nose to complete the operation and this may be done best with a small gauge or with Hajek's swallow-tail chisel.

The opening thus made should be as far forward as possible and large enough to preclude the chance of its being obstructed by granulations and to allow easy egress for subsequent irrigation. The nasal mucosa should now be stretched by a grooved director passed through the anterior nares and the mucous membrane corresponding to the bony opening just described, incised with a sharp scalpel on its anterior, superior and posterior borders, leaving it intact along the floor of the nose.

After a thorough inspection of the cavity it should be irrigated with warm saline solution, all blood clots and other debris removed, and be lightly packed with iodoform or bismuth impregnated selva gauze. A long strip of gauze is introduced through the nose into the antrum until the cavity is lightly packed, great care being taken that the rectangular flap of nasal mucosa is turned outward and lies smoothly on the floor of the sinus. The original incision in the labio-gingival fold may now be closed with cat-gut sutures or the sutures may be omitted entirely as the edges of the wound will usually fall naturally into position and healing is obtained by first intention.

The after-treatment of a radical operation is comparatively simple, the labial wound needing no care. On the second or third day the packing should be removed through the nose, first softening it by repeated injections of warm saline solution, care being exercised that the flap of mucous membrane on the floor of the antrum be not disturbed or rumpled up as the gauze is withdrawn. The sinus should now be irrigated every other day with warm saline solution, dried and powdered with iodoform or one of the bismuth preparations until secretions cease and a cure is obtained, which may take from a few weeks to a few months' dependent upon the amount of mucous membrane removed at the time of operation and the recuperative power of the patient.

If the Caldwell-Luc operation does not effect a cure it is because all diseased tissue has not been thoroughly removed, enough being left to continue the suppuration and thus reinfect the whole cavity. It is not always possible to reach all diseased areas within the antrum, the portion in the anterior angle being peculiarly inaccessible even with bent curettes. If, therefore, the Caldwell-Luc operation does not result in a cure of the empyema, or if the disease is so extensive as to foreshadow failure from the start, recourse must be had to the most radical of all operations on the maxillary sinus which is known as the Denker operation and which is the latest addition to our operative procedures. The object of the Denker operation is to remove entirely the bony wall of the anterior, inferior angle of the sinus, the rest being done according to the Caldwell-Luc method. By removing this additional bone, complete access

is obtained to every part of the maxillary antrum, all mucous membrane may be readily curetted away and the interior be open to direct inspection with the possible exception of the anterior superior angle where a small post-nasal mirror may be used. The technic is as follows:

The initial incision should be longer than in the Caldwell-Luc operation extending almost to the median line, or the superior labial frenum. The periosteum is now elevated over the whole of the canine fossa inward to the crista pyriformis. With a small elevator the periosteum on the nasal side of this bony prominence is elevated along the external wall of the inferior nasal passage as high as the attachment of the inferior turbinate and as far back as it is desired that the posterior boundary of the naso-antral opening shall reach. As in the Caldwell-Luc operation the anterior wall of the antrum is now removed, this removal of bone extending inward to the pyriform aperture and thence backward along the external wall of the inferior meatus of the nose about an inch or an inch and a half. To avoid injuring the nasal muco-periosteum previously elevated, it is advisable either to introduce a strip of gauze between it and the bone to be removed or to cut it into a rectangular flap with the base attached as in the Caldwell-Luc process and to turn this flap inward into the nose out of the way. The bone of the naso-antral wall may be removed with either chisels or cutting forceps. If the muco-periosteum overlying this bone has not already been converted into a rectangular flap this is now done and after a thorough curettage of the antral cavity, it is turned outward onto the floor of the sinus. The remainder of the operation is the same as in the Caldwell-Luc method.

By Denker's method of operating the permanent opening in the naso-antral wall is situated much nearer the anterior naris than in the less radical one; therefore, subsequent inspection and treatment of the interior of the cavity can be more easily and thoroughly carried out.

SUMMARY.

1. Cases of antral suppuration where the intra-nasal operation has failed to cure should receive treatment by either the Caldwell-Luc or the Denker methods.

2. Cases in which it is apparent from the outset that an intra-nasal operation will fail to give relief should immediately be given the benefit of an extra-nasal operation. These are cases usually of long standing where there is extensive degeneration of the mucosa or caries of the bony walls.

3. The Caldwell-Luc and the Denker methods are the only extra-nasal methods advised.

4. If the Caldwell-Luc operation fails the Denker method is the last resort.

5. The Caldwell-Luc operation consists in removing a large part of the anterior wall of the sinus maxillaris, the thorough curettage of all diseased tissue and the establishment of a permanent intra-nasal opening, allowing the initial incision under the lip to close by first intention.

6. Denker modifies this by including the anterior angle beneath the crista-pyriformis in the bone removed.

DISCUSSION.

DR. HERBERT GODDARD: I wish to call special attention to that part of the lateral wall of the nose known as the pars membranacea. This structure being composed of but two layers of mucosa is the first to show pathological changes in the maxillary sinus. If bulging of any wall occurs this must of necessity be the first one to show such changes. The fact that when accessory ostia are present they are situated in this structure also contributes to its importance.

DR. O'REILLY showed one specimen which he termed a double sinus but which in reality was a tooth cyst. Double sinuses are caused by an ethmoid cell growing into and encroaching upon the antral cavity and are purely physiological while tooth cysts result from pathological changes occurring in a root of one of the teeth.

DR. MACKENZIE mentioned pain as a diagnostic symptom in maxillary sinus disease. In my experience the pain is rarely located over the sinus proper but is particularly manifest along the course of the supra-orbital nerve; thus simulating frontal sinusitis. Regarding the radical operations under local anesthesia I would emphasize particularly the importance of thorough cocaineization before starting the operation as this will prevent many vexatious delays and subsequent pain to the patient.

The pre-turbinal method advocated by Dr. Skillern is the easiest and most satisfactory intra-nasal method at our disposal.

DR. C. H. KISTLER spoke of a curious complication in a case which became infected through extracting a tooth. Four days after the tooth was drawn infection of the antrum occurred. The patient had never complained previously of antral trouble. In applying treatment it was noted that the sinus could not successfully be irrigated through tooth cavity. Needle puncture through the inferior nasal passage was made and the antrum washed out. The case progressed favorably, irrigations being practiced every other day for a month. One day after proper introduction of the needle it was noted that fluid could not be forced into the sinus even under considerable pressure. As no exacerbation of the disease was noted what was the cause of this obstruction to the outflow of the liquid?

DR. E. B. GLEASON said that he had had the same experience with the Lichtwitz needle which is one of its disadvantages. This was in an acute case in which some difficulty was experienced in washing out the sinus on the first insertion; therefore, simple aspiration was practiced. Afterwards the irrigations were successful until one day the natural opening refused to allow the outflow of the injected liquid even under enormous pressure. The middle turbinate was infracted and a cure quickly followed.

For diagnostic purposes the X-ray is one of the most reliable means at our command to give us information regarding the exact condition of the sinus mucosa and should never be neglected in doubtful cases.

In operating intra-nasally he has made use of Well's rasp by which it is possible to install an opening an inch long in the inferior nasal passage. After this has been done it is an easy matter to irrigate the sinus with an ordinary Eustachian catheter.

DR. WILLIAM HITSCHLER exhibited a curious specimen in which both maxillary sinuses were not larger than a small chestnut and spoke of the many anomalies in the sinus which must be guarded against. Referring to Dr. Reber's case a negative report had been made as the patient had a large septal ridge which prevented a free examination. This was subsequently removed, the anterior end of the middle turbinate was hypertrophied and also removed. Still there was no evidence of sinus disease. One day a mass of thick calloid material was noted at the anterior extremity of the middle meatus and a large opening was then made into the maxillary sinus and a quantity of calloid material escaped into the nose. The tension on the eye immediately disappeared. No pus was ever present and in a few weeks the condition entirely cleared up.

As far as operating through the middle nasal passage is concerned, on account of its being the thinnest wall it is a dangerous procedure, as in many cases this wall lies very close to the orbital cavity. In 500 of the 1000 specimens in Zuckerkandl's and Hajek's collections the close proximity was apparent, and consequently represented a contra-indication to any form of operation in the vicinity. The roots of the teeth may be several centimeters from the floor or may project into the antral cavity. In one of these cases the pressure on the hard palate caused pus to flow out of the nose. The pain depends upon thickness of the antral wall. Irrigation may also be practiced through an accessory ostium which is present in about ten per cent of all cases.

The exploratory needle puncture should always be made in the posterior part of the inferior meatus as the anterior wall presents much more solid bony structure. When the hard palate is high and the lateral wall of the nose bulged outward the maxillary sinus is sure to be very small and difficult to reach by any intra-nasal procedure. It is fortunate, however, that one seldom finds disease in small sinuses.

The Chair, in answering the queries of Dr. Kistler why the fluid refused to return after a needle puncture, said that this could be due to four causes: (1) Point of the needle might be introduced in the mucosa of the posterior wall. (2) The mucosa might be so swollen as to occlude the lumen of the sinus. (3) The middle turbinate might be swollen and press upon the lateral nasal wall thereby preventing escape of fluid through the natural ostium. (4) The lumen of the needle might have become plugged by a spicule of bone.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

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JOHN F. MCCOY, M. D., CHAIRMAN.

DR. MAYER said that he recalled the case presented by Dr. Oppenheimer, as Dr. Manges had requested him to examine the patient when he was admitted to his service, and most careful examinations were made from time to time to elicit the site of infection. The first question that arose was whether the man had not had some infection in the neighborhood of the wound. It was important to demonstrate that, and examinations were made to ascertain if anything could be found which would in any way account for the entrance of the infection. So important was this considered that he and Dr. Yankauer made independent examinations, but were not able to demonstrate any infection of the accessory sinuses. The case was peculiar to itself in many ways, and he had never been able to satisfy himself about it. The man's infection was directly traceable to the operation. He had an acute otitis, and a sudden cessation of the discharge for a couple of days; immediately after that the submucous resection was done, and in the physician's office, not in the dispensary, so that even that added care was given to this particular case. At one time he had felt that the man would never be in condition to be presented, as had been done this evening. All should remember that infection may follow an operation that is generally considered to be unusually safe.

DR. QUINLAN said that he could relate a similar case which occurred before the days when the submucous operation was so common. A spur which involved the posterior part of the cartilage and bone was removed—an ordinary, hourly occurrence. It was done under careful antiseptis, then spraying with adrenalin and cocain to thoroughly anesthetize the parts. Two or three days later the patient returned with a violent pain in the ear; he said that he had blown his nose that morning with some force, and later the pain developed. There were well defined conditions of acute otitis media, the posterior and superior wall was bulging, and the rapid development of the condition was alarming. Ordinary remedies were applied, but the condition did not subside, and in twenty-four hours an incision was made to relieve the drum tension. As Dr. Quinlan was going out of town, the patient was left under the care of Dr. Whiting, who did a mastoid operation the next day with all the care and skill for which he is so well known. The patient, however, developed metastatic abscesses of the hip, and was in the hospital for seventeen months. A portion of the head of the femur softened and melted away, and this leg is two inches shorter than the other. Up to the time of

operation he was apparently in fair health, and simply sought relief for a moderate deviation of the septum, and this awful catastrophe followed. The first operation was done in a stereotyped way, and carried out as carefully as possible, and yet this serious condition followed the re-infection of the middle-ear and mastoid operation. One cannot be too careful in these simple operations.

DR. SEYMOUR OPPENHEIMER said that he was much pleased that he had presented the case, for it was well to have the enthusiasm for such an operation kept within bounds. Such occurrences teach one to be more careful in the expression of opinion, for mishaps can and do happen in the hands of the most skillful operators. He felt that one error had been made by the operator in this case—in his judgment, the subjection to operation of a patient having an acute infection present in his nose was bad practice. That brings up the point that there are many apparently quiescent nasal cases to which we do not pay sufficient attention at the time of operation. The nose should be examined very much more carefully, especially in dispensary practice, in order to determine whether there may not be some trouble in some of the smaller accessory sinuses, before many of the operations are undertaken which we are now doing.

Retro-laryngeal Abscess of Streptococcic Origin. By O. GLOGAU, M. D.

Mr. M. K., was referred to me on December 2, 1911, by Dr. S. Tandlich.

Anamnesis: The patient was perfectly well until five days ago. Suddenly he became aware of pain in the throat which gradually became more excruciating in character. Being unable to swallow he is becoming weak from lack of nourishment. Attempts at swallowing water or his saliva cause agonizing pains in the throat which shoot up into his right ear. The pain is felt distinctly on the right side. Neither a history of syphilis nor of tuberculosis is obtainable. No history of injury or foreign body in throat.

Status praesens: The patient appears to be a middle-aged man, not very robust, and seems to be suffering acutely. Externally there is no swelling visible. The right submaxillary region is tender on pressure. The ear-drums are normal. Upon depressing the tongue, a swelling is seen occupying the space between the base of the tongue and the epiglottis. It is of a deep red color, has a lobulated surface, is hard to the touch and does not fluctuate. It is the size of a hazel nut. The anterior and upper surface of the epiglottis forms part of the growth and is displaced backward by the latter, so as to completely occlude the entrance to the larynx. Inspection of the larynx is thus made impossible. The pharyngeal mucous membrane is reddened on the right side, but there is no bulging. Temperature 101° F., pulse 97. Diagnosis: Acute perichondritis of the epiglottis.

As there was no ulcer present on the epiglottis itself (this is given as the most frequent cause of such conditions) I concluded that there must be some lesion in the larynx proper. The growth was incised but no fluid was evacuated. Treatment: Hot antiseptic gargle. Hot flax-seed poultice externally.

December 3, subjective symptoms unchanged. Upon inspection it appeared that the swelling had subsided a little and thus permitted a view of the larynx. A cyst-like swelling of a whitish color, the size of a hazel-nut was now seen projecting into the right side of the larynx, and having its base on Santorini's cartilage. There was a diffuse infiltration of the right arytenoid cartilage and the posterior part of the cricoid cartilage and extending forwards toward the annular part of the latter. Here was apparently the primary focus. Suspecting pus, the writer made several exploratory incisions with a protected laryngeal knife, but none was discovered.

The following day a swelling the size of a fist appeared just below the jaw, the pus evidently having invaded the cellular tissues of the neck. There was, however, no fluctuation discernible. The writer called Dr. Freudenthal into consultation and he agreed in the diagnosis and also in the advisability of opening the abscess from the outside.

Operation: On December 7, at St. Mark's Hospital, under general anesthesia, an incision was made by the writer over the swelling in front of the sterno-mastoid muscle and at the level of the hyoid bone, by means of blunt dissection and by aid of the index-finger the tissues were separated until a large abscess cavity was reached and emptied of a large quantity of yellowish, foul pus. Within the cavity, the carotid artery could be felt pulsating. On the inner side a roughened area of cartilage proved to be the partly destroyed annular portion of the cricoid cartilage. While examining the location the finger slipped through the abscess wall and a communication of the abscess cavity and the interior of the larynx resulted. At this moment a quantity of pus escaped from the patient's mouth. A cigarette drain was inserted and made to protrude slightly into the larynx, thus effecting thorough drainage. The patient improved rapidly. The drain was shortened daily until its final removal.

The larynx and pharynx have become normal again except that there is still a slight induration in the upper part of the epiglottis.

Etiology: As regards the possible etiology of the abscess, the pus of which contained streptococci in chains, both syphilis and tuberculosis may be excluded from consideration. The Wassermann test and also the von Pirquet test gave negative results. The one point which may be a possible aid in clearing up the obscure etiology is the fact stated by the patient, that when he had been sick a few days he had spit up a hard mass (foreign body?).

It is likely that this foreign body had been the direct cause of the abscess-formation. Thus an infection near the right arytenoid cartilage caused a perichondritis of the same. From here the infection spread to the annular part of the cricoid cartilage and to the cartilage of Santorini and thence to the anterior part of the epiglottis which gave the picture of swelling and induration at the base of the tongue first. The abscess burrowed into the neck where it was opened by operation.

DISCUSSION.

DR. FREUDENTHAL said that when he saw the patient in consultation with Dr. Glogau, a very different appearance was presented from that

now shown. The man was suffering from a severe dyspnea, had not been able to take any food for some time, and was very weak. Examination of his larynx revealed a mass filling the right glosso-epiglottic fold, and in connection with this there was a swelling on the outside of the neck. Within the larynx the picture was as described by Dr. Glogau.

Recalling cases which he had presented before the section last year, he was very much in favor of immediately opening the abscess by the external operation. Perhaps some of the members might recall the patient whom he had presented ten months before—a man 60 years of age, who had developed an abscess in the larynx. He had refused operation, and a little later fell down in the street unconscious. Fortunately, he was carried to the hospital where a quick tracheotomy was performed. That man is still living, and is carrying around his tracheotomy cannula. Much more important was another case—a young woman who had developed an abscess for which an external operation was refused. Two incisions were made intra-laryngeally and a great deal of pus was evacuated, when suddenly she fell down and became cyanotic. In spite of immediate tracheotomy, she died after twelve hours.

In regard to the etiology of these cases, Dr. Freudenthal said that he did not quite agree with Dr. Glogau. Of course, Dr. Glogau had seen this development in the larynx first, but according to the cases which he had seen himself and those he found in literature, it would seem that the origin of these cases was in the naso-pharynx. They come by the lymphatics and cause all the trouble. This case of Dr. Glogau's, his own, and others which he had seen—whether called angina Ludovici or by other names—apparently have the infection coming from higher up, viz., the naso-pharynx.

Dr. LEDERMAN said that he had seen several cases similar to this one, which he had reported some time ago under the head of "septic infections of the mouth and throat."* A case which he had seen about three years ago was due to traumatism of the lower part of the pharynx. The patient had an abscess in the outer wall of the pharynx. The symptoms increased rapidly, and it was only after careful examination under cocaine that he could determine the focus of infection, which was in the lower pharynx. The localized tumefaction of the throat at this point made him think of opening at that position. Immediately upon the incision pus was evacuated, and the edema gradually disappeared. The patient would probably have choked to death in a few hours had not the focus of infection been found. A week prior to the symptoms the woman had swallowed a bone and had evidently lacerated the mucous membrane, the wound subsequently becoming infected.

The other case was that of a young woman 25 years of age, who suddenly developed a sore throat. There was no history of trauma. When seen in consultation, she had a marked edema of the epiglottis and aryteno-epiglottic fold on the right side, and she was beginning to experience difficulty in breathing. He advised incision. The one point which looked like a localized tumefaction was at the base of the epiglottis, and on incising it rather deeply with a curved knife about three-quarters of

*The Laryngoscope, June, 1911.

an inch from the surface, a cavity was entered containing pus with a very foul odor. The condition had existed for only twenty-four hours. The pus showed a streptococcal infection, with some pneumococci.

Sir Felix Semon states that any form of the pyogenic organism may give rise to an inflammatory condition without pus-formation, but that the streptococci are the most active. He has seen a patient one day with a sore throat but no alarming symptoms, and the next day that patient was dead. His report is very striking. These rapidly advancing septic condition of the throat are very serious.

Dr. DOUGHERTY cited two cases, one of which Dr. Quinlan will probably recall as it occurred in his service when he (Dr. Dougherty) had been chief of clinic. A man, 42 years of age, came to the clinic suffering from extreme dyspnea, with edema of the glottis and of all the soft tissues of the laryngeal structure. With the aid of the adrenalin spray and some scarification, he was made fairly comfortable for the night. Some twenty-four hours later, however, he was called to see the patient and found him suffering from what seemed to be a peri-tonsillar abscess—a large phlegmonous swelling of the larynx. This was incised without finding pus. One of the other assistants saw the man that evening; the next day, he himself called again, and while he was there the man died. Autopsy showed a pus sac well under the sterno-cleido-mastoid muscle, and an immense phlegmonous infiltration of all the tissues on the right side of the neck.

In the other case, occurring at the Polyclinic Hospital, the patient was a bartender who presented himself, showing practically the same symptoms. A large pus sac was opened under the angle of the jaw, and half a pint of pus was evacuated. Both cases gave a history of having had an acute follicular tonsillitis several days before.

Dr. HURD, referring to Dr. Freudenthal's statement that the larynx was usually infected from a septic condition in the naso-pharynx by direct extension to the larynx by the lymphatic channels, said that the region of the naso-pharynx drained directly into a chain of glands situated posteriorly to the sterno-mastoid muscle, and the lymphatic drainage of the faucial tonsil was into a gland at the angle of the jaw in front of the muscle; and that the lymphatics from the larynx drained into the deep glands situated along the carotid sheath. Although it was possible that an infection could take place in this roundabout manner, it was quite improbable. It was Dr. Hurd's belief that the case under discussion was probably infected from the lingual tonsil. The fact is often lost sight of that there is a peri-tonsillar abscess-condition of the lingual tonsil as well as of the faucial tonsil. Septic infections of the larynx are usually secondary to either a similar condition in the lingual or faucial tonsil, and that infection extends by continuity along the facial planes to the larynx.

Dr. QUINLAN said that the question of acute abscess of the lingual tonsils is not sufficiently emphasized. Some years ago Dr. Swain had recited a number of cases of suppuration of the lingual tonsil. He himself had seen two cases of this condition in which everything was distorted and out of proportion. The focus of infection was found to be in

the fossa of the tongue, and on puncture a large amount of pus was evacuated. He would like to know the nature of the expectorated mass mentioned in Dr. Glogau's case.

DR. GLOGAU replied that the expectorated material was thrown away at the time and consequently had not been examined. It was rather hard. He could not agree with Dr. Freudenthal's idea in regard to the naso-pharynx being the primary focus from which the infection spread into the larynx. Hajek, in his elaborate work on this condition, in "Heymann's Handbuch," does not mention changes in the naso-pharynx as etiological factors. This case, and the similar ones mentioned in the discussion, demonstrate that a deep laryngeal abscess is best dealt with by external operation.

Case of Vincent's Angina. By GERHARD COCKS, M. D.

The man had come to Dr. Chappell's clinic a few days before, stating that he had suffered for two days from soreness on swallowing. There was a mass of cervical glands on that side of the neck, the man had a temperature of 99°, and on the tonsil was what seemed to be an ulceration half an inch long and almost as wide, involving the posterior pillar. He gave a history of having had measles in childhood. A year ago he had had an attack of tonsillitis involving both tonsils. No venereal history. The ulceration had the appearance of the pseudo-membrane in a diphtheria case. The patient was sent to the laboratory for a smear, which showed Vincent's bacillus and spirillum.

DISCUSSION.

DR. GLOGAU asked if Dr. Cocks ever used salvarsan in severe cases of Vincent's angina. Professor Gerber (*Zeitschrift fuer Laryngologie*, Heft 3, 1911), from the splendid result brought about by the use of salvarsan, considers ulcero-membranous angina a spirochaetic disease, while only some minor symptoms may be attributable to the action of the fusiform bacillus.

DR. COCKS replied that he had not tried salvarsan, as the case was a very mild one and was rapidly recovering.

Presentation of New Instruments. By SEYMOUR OPPENHEIMER.

The instrument was devised by an instrument-maker in Heidelberg for cutting the maxillary antrum and enlarging the opening by means of two lateral punching flanges which come into operation after the maxillary wall is penetrated. He considered the instrument a very ingenious mechanical contrivance and had found it to work admirably in a case where the internal maxillary wall was not too hard. He considered it particularly useful in those cases of acute antral suppuration where it is desirable to maintain a small opening for a number of days, which could be done with this instrument without being compelled to re-puncture each day or two.

Reconstruction of Nasal Septum; Preliminary Report. By GEORGE H. SEMKEN, M. D.

DISCUSSION.

DR. YANKAUER said that Dr. Semken was to be congratulated on the work he had done. All the members of the section were interested in

these cases, for all have occasion to see them and to operate on them. He had operated recently on a case of saddle nose, but had employed the technic described by Dr. Roe, which is very well adapted to these cases and is not as difficult as is sometimes thought from Dr. Roe's description. The operation is done by cutting a flap from the outer nasal wall on each side and hinged where the septum joins the dorsum of the nose, the two flaps being made on the outer nasal wall and including some of the lower lateral cartilage. The incision is carried across the median line so that the entire skin of the dorsum is undermined, and then the two flaps are turned upward so as to meet in the median line and are there held together by a stitch. Yankauer had done two cases by the method, and the first was not a brilliant success, for the suture broke as he was about to tie it. The second case, however, was entirely successful, but as it was only a week since the operation the ultimate results could not be known. It was done under cocaine at one sitting. In the operation, Dr. Roe puts on an external dressing, consisting of a plate of lead, shaped to fit the nose. Dr. Yankauer said that he had not done this, but in the second case he saw the reason for it, as a hematoma formed in the upper part of the nose, whereas if a plate had been placed over the nose the ecchymosis would have come lower down.

Dr. ABRAHAM also complimented Dr. Semken on the results obtained in these cases. While he himself had never operated on any cases of this kind, he had last summer been very much interested in the work of Dr. Joseph, of Berlin, one of the most eminent nasal plastic surgeons of today. The method he employed in a case of saddle nose on which he operated was rather simple. He did not use cartilage, but bone taken from the tibia. He simply made an incision of the muco-cutaneous junction within the nose, separating the skin from the underlying tissue, and inserted the strip of bone beneath the skin on the bridge of the nose, coming down to the tip. The result was very remarkable. He had also corrected various other deformities of the nose.

Dr. McCoy, as Chairman, tendered the thanks of the section for the very interesting and valuable paper presented by Dr. Semken. The remarks made by Dr. Abraham recalled the time when he saw a foreigner do a submucous resection. He removed the cartilage so that the nose fell flat, and then inserted a piece of the vomer from the lower part of the nose and sewed it inside. Dr. McCoy said that he had asked the doctor if he was in the habit of replacing bone in that way, and he replied that this was the first case he had so treated. His usual custom was to have the leg prepared, and in case any such catastrophe occurred to use a piece of the tibia.

Paralysis of the Left Vocal Cord Cured by Salvarsan. By G. R. SATTERLEE, M. D. (By invitation.)

The patient was originally referred to Dr. McCoy's clinic as a case of paralysis of the left vocal cord. He was 50 years of age, married, and a chef by occupation. Twenty-five years ago he had a severe attack of jaundice; thirty years ago, he had an attack of gonorrhea, and a small chancre of which he thought nothing. He took nothing but local treat-

ment; knew nothing of having had an attack of syphilis. His present illness came on over three years ago, when he applied for treatment for an attack of indigestion, for which he was treated in one of the hospitals, and at that time complained of dyspnea. The condition was diagnosed as pulmonary tuberculosis by several well-known men in the city, and he was sent out of the state for treatment.*

On January 18, 1912, patient received 3 gram of salvarsan intramuscularly, resulting in decided improvement of the pain in the back from which he had been almost constantly suffering. By February 28, 1912, the patient had had thirty-eight injections of salicylate of mercury in oil and an average of about 60 grams of potassium iodid per day since he has been under treatment from May, 1910. Radiographs of the chest show no perceptible decrease in the size of the aneurysms. His condition to-day is good, with a moderate gain in weight, no dyspnea, no vocal interference and a moderate degree of pain in the mid-dorsal spine and sixth, seventh and eighth ribs in the left maxillary line.

Dr. McCoy, on behalf of the section thanked Dr. Satterlee for presenting this case. He then said that the patient had first come to him as a laryngologist, as these cases so often do, and then pass into the hands of the internist. On examining the throat, it presented an absolute paralysis of the left side of the larynx. Since the administration of the salvarsan, the man has almost complete motion of the left vocal cord. This condition should be remembered in considering cases of laryngeal paralysis.

Dr. GLEITSMANN stated that he has more than once before emphasized the importance of specifying the nature of the paralysis of the cord, as the general term of paralysis does not indicate its character.

The case in question seems to be a recurrent paralysis, which as well as abductor paralysis had been reported cured by specific treatment already by Lefferts in 1878.

The speaker published in 1901 a case of unilateral recurrent paralysis with complete aphasia, due to a syphilitic lesion in the mediastinum. In course of time the aphonia disappeared, the voice returned, and the paralyzed cord assumed and remained in the median line, showing a complete abductor paralysis. The change from the recurrent to the abductor paralysis is explained by the well-known fact that the abductor muscles recuperate quicker under favorable conditions than do the abductors.

Dr. SATTERLEE said that he believed in giving small doses in these cases on account of the danger of creating too much resolution in the weakened walls of the aneurysm. This patient received a half dose each time.

A Case of Cavernous Angioma of the Nose in a Child. By WOLFF FREUDENTHAL, M. D.

The patient was a Grecian boy, 1 year old. The mother said that from the day of the child's birth she had noticed a swelling on the nose, which had been continually growing larger. It was difficult to obtain

*History of case reported in New York Medical Journal, January 13, 1912.

much of the history, as the mother spoke only Greek. The tumor occupied the upper part of the nose, mostly on the right side, and was very soft. Dr. Freudenthal said that he had seen the child the day before and the tumor seemed to have grown since. It was quite clear that it was a cavernous angioma of the nose. It did not seem to penetrate into the hard bone.

The treatment in this case was important. It was not advisable to try anything like applications of carbonic snow, or hot water injections or the like, on account of the possibility of injuring or destroying the eyes. The only thing seemed to be to make an incision in the skin and lift up the mass, and if the efferent vessel could be found and ligated the result would probably be very good. If he were allowed to perform this operation, he would report the result at the next meeting of the section

Report of Three Cases of Syphilis of the Nose and Throat Treated with Salvarsan. By WOLFF FREUDENTHAL, M. D.

During the last eighteen months, I had occasion to treat twenty cases of syphilis of the upper air tract by means of salvarsan. Permit me to present to you three patients treated in that way. Before doing so, I would like to mention here a case that ended fatally. Mr. D. S., aged 35, of Philadelphia, had received two injections of salvarsan in Philadelphia, at intervals of three weeks. In spite of this, he grew worse. When he was referred to me, he told me that he had suffered from dysphagia for the last six months, pain in the right ear, and hoarseness. He had become emaciated, and had lost his appetite completely.

There were ulcerations in the pharynx, on the epiglottis and vocal cords, and it was almost impossible for him to take any kind of food. In view of the fact that he had received salvarsan twice, we did not dare to repeat it again, but injected mercury daily—three times a day he received insufflations of orthoform, but in spite of all our efforts he lost ground steadily, which was due mainly to the fact that he could hardly take any nourishment whatsoever. Three weeks later it was noticed on examination that tuberculosis of the lungs had developed, and in a very short time the patient died. The other cases presented here are:

Case 1. J. R., tailor, 23 years of age, reports that for the past eight months he has been suffering from dryness in the throat and painful swallowing. This was accompanied by moderate cough, night sweats, and loss in weight. Eight days ago the patient had some physician manipulate his palate, as a result of which he presents a perforation of the soft palate. There is formation of scabs in the nose, perforation of the septum, and the remaining part of the septum is in an ulcerative condition. He received 0.4 salvarsan, intra-venously, and within one week a large sequester from the nose came out, and all the subjective and objective symptoms disappeared.

Case 2. H. R., aged 28, a baker. Has had a sore throat for the past six months; pain on swallowing, foul odor of mouth, persistent headaches, and falling out of hair. There was never any primary lesion or general eruption.

Pharynx shows a marked round growth on posterior wall, extending along the whole wall, especially marked on the right side where a dis-

inct tumefaction is visible, on top of which is a deep ulceration. Tonsils very much congested. Slight enlargement of cervical and of inguinal glands. He received one injection of salvarsan in both lumbar regions, after which the gumma entirely disappeared. The patient soon re-entered the hospital with severe pain at the site of injection, with some fever and marked prostration. These symptoms soon disappeared.

Case 3. Sophie C., aged 19; was admitted to the hospital under a suspected diagnosis of typhoid fever, but as she complained of a sore throat, I was asked to examine her. Then a clear history of lues was given. About a year ago she had developed a rash over the trunk which has remained to the present time. Headaches for the past year. Three months ago patient developed a sore throat, which at times is painful, and then she is unable to take food. This has remained to the present time. There are condylomata around the anus. The throat shows an ulcer of the pharynx, and mucous patches over the tonsils. Epitrochlear and post-cervical glands enlarged. She received two injections, and left the hospital apparently cured within a few weeks.

The results achieved with this method were so excellent that they attracted the attention of every one who saw these cases. But I must say here that we were not able to follow up the patients later, as they never showed up again for treatment.

Adductor Paralysis of Left Vocal Cord Due to Mediastinal Tumor. (Presentation of Patient and Skiagraph). By CORNELIUS C. VAN WAGENEN, M. D.

(Published in full in this issue of THE LARYNGOSCOPE, p. 1033.)

DISCUSSION.

DR. GLEITSMANN said that, as the question had been raised, if the case was not one of unilateral adductor paralysis, such paralysis of the adduction of one side only were not known to him after an extensive study of the literature on laryngeal paralysis. The few isolated cases of unilateral adductor paralysis were not beyond reasonable doubt, and opinions are still divided.

In addition, adductor paralysis of the bilateral type is generally considered of cortical origin, often occurring as a reflex action, f. i., from fright, sexual, psychical influences, and the like.

As he had not examined the patient, he was loath to express a definite opinion about the nature of the paralysis, but a beginning recurrent paralysis would explain the laryngeal picture, as well as the etiological factor.

DR. VAN WAGENEN, replying to Dr. Gleitsmann, said that he thought there was some abduction in the cord and therefore put it down arbitrarily as adduction entirely. There was certainly some motion in the left cord of abduction, and that was the reason he did not put it down as a complete left cord paralysis, but as an adductor paralysis. It had been shown, by dissection and electrical stimulation, that there were two bundles in the nerve trunk; one to the outer side for adduction and the other to the inner side for abduction. He thought that the node was pressing more on the outer than the inner side of the nerve.

BOOK REVIEWS.

The Skiagraphy of the Accessory Nasal Sinuses. By A. LOGAN TURNER, M. D., F. R. C. S. E., F. R. S. E., Edinburgh, and W. G. PORTER, M. B., B. Sc., F. R. C. S. E., Edinburgh. 39 plates; William Green and Sons, Edinburgh and London, 1912. Price, \$2.50.

In the past few years skiagraphy has provoked such universal interest as a means of investigation and diagnosis in the anatomy and pathology of the accessory sinuses of the nose, that many close observers in otolaryngology have given this special field their careful attention, and much valuable data has been published.

Among the pioneers in this field is our British co-worker, A. Logan Turner, who through years of research in the study of the accessory nasal sinuses, their surgical anatomy, their inflammatory infections, their diagnosis and treatment, has especially equipped himself to write authoritatively on this subject.

We recall to our readers our review of his masterful monograph on the accessory sinuses of the nose published about ten years ago.

Turner, in collaboration with Mr. W. G. Porter presents a beautiful series of thirty-nine plates showing the normal and pathological appearance of the accessory sinuses in skiagrams.

The apparatus and technic used in the production of the X-ray negatives are carefully described, and an interesting chapter devoted to the interpretation of skiagrams of the nasal and accessory sinus cavities in their normal, anatomical and pathological relations and variations.

Each X-ray plate is minutely discussed, and the many sources of errors in the interpretation of plates are carefully recorded.

The authors draw the following general conclusions regarding the value of skiagrams in accessory sinus disease:

1. Skiagraphy is a valuable aid in the study of the development of the air cavities, and is the only means by which we can determine in the living, without operative interference, the existence of all the air sinuses.
2. Skiagraphy enable us to define the size of the frontal sinus, the position of the inter-sinus septum, the presence of subsidiary partitions in the cavity, and a supra-orbital extension of the sinus; also to some extent the relation of the sinus to the anterior ethmoidal cells can be determined.
3. Skiagraphy puts us in a better position to determine what operation to carry out upon the diseased frontal sinus or ethmoid cells, and also in a lesser degree upon the maxillary and sphenoidal sinuses.
4. In conjunction with other methods skiagraphy is of great value in diagnosing inflammations and suppuration of the sinuses.
5. In children in whom it may be inexpedient to carry out intra-nasal diagnostic procedures, skiagraphy is of great value.
6. By means of the fluorescent screen we can ascertain the position of cannulae and other instruments introduced into the sinuses for therapeutic purposes.
7. The skiagram may be usefully employed in ascertaining the size of dental cysts occupying the maxillary sinus, in determining the origin of choanal polypi, in defining the limitations of malignant growths and detecting the presence of foreign bodies in the sinuses.
8. It is also of service in determining the effect of treatment upon inflammatory affections of the sinus.

This volume merits a very careful perusal by all far-sighted nose and throat specialists who wish to utilize every possible research and advancement that has been made in radiography.

